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THE BOSTON
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ORIGINAL ARTICLES

RICKETS

BY JOSEPH GARLAND, M. D., BOSTON*

INTRODUCTION

RICKETS is a disease of civilization. It is the result of abnormal environmental conditions that man, in his efforts at self-betterment, has erected about himself without realization of the fact that artificial means of protection have deprived him of certain less perceptible ones that nature designed for his safety. Nature provided man, in his more primitive modes of living, with sunlight and a natural diet. Man, who is born into trouble as the sparks fly upward, has shut himself up into houses where the sunlight cannot reach him, and has substituted for a natural abundance of diet a diet of concentrated, preserved and altered foodstuffs. Among the other penalties that he has paid, a very astonishing prevalence of rickets among his children has been the result.

Rickets is practically unknown among two remote classes of people who benefit from a primitive manner of living. Tropical races spend much of their lives out of doors and are protected from rickets by sunlight; the Eskimos are deprived of the sun's rays for long periods of their existence, but are protected by a diet abundantly supplied with natural fats. These principles were recognized empirically by an older school of clinicians from Bretonneau and Trousseau on. In fact, if we turn back to the pages of J. Lewis Smith's text book, published in Philadelphia in 1879, we may read that "rickets is due to residence in a cold and and moist climate, or in dark and damp and ill-ventilated apartments" and that "the medicines which are of undoubted efficacy in rickets are codliver oil and lime."

Modern scientific scepticism, however, that demands demonstrable proof of each of Nature's phenomena, discarded the experiences of these observers as being untrustworthy and unsusceptible of laboratory proof. For a number of years the causes and cures of rickets again remained shrouded in darkness until these same modern scientific methods demonstrated that the old observers were right, and reëstablished their principles.

It is now universally recognized that certain short rays in the ultraviolet zone of the solar spectrum will prevent and cure active rickets, and that a property or properties inherent in certain fats, of which codliver oil is the classical example, can accomplish the same results. When Mellanby[13], however, in 1918, demonstrated that experimental rickets can be produced and cured at will in animals, rickets took the centre of the pediatric stage, and has held it until the present day.

Regardless of the spectacular aspect of modern investigations of rickets—its experimental production; the theatrical cures that are effected with ultraviolet radiation and codliver oil; the niceness of chemical balances that demonstrate its presence or absence, or its healing stage, and the effectiveness of the roentgen ray in portraying these same facts—rickets in its own right deserves the distinction that has been allotted it, for by virtue of its prevalence, its complications and its sequelae, it constitutes the most important disease entity of infancy.

HISTORICAL

Ancient medical literature, even that of such careful observers as Hippocrates and Galen, contains so few allusions to any condition that might be interpreted as rickets that we may fairly conclude that rickets did not exist to any degree in those times. Undoubtedly the fact that ancient civilizations flourished in warm and sunny climates, where much of life was spent out of doors, is responsible for this absence. Ancient human bones, according to Howland[2], rarely show changes that may be ascribed to rickets, although bones of monkeys from Thebes, over 2,000 years old, do show such changes.

The first authentic knowledge that we have concerning rickets as a prevalent disease suggests that it first appeared in Europe in the sixteenth century. The reason is obvious. Populations, particularly in England, a country never noted for its abundance of sunlight, were driven into city living for industrial reasons. Their children were deprived, by housing conditions, of such scanty sunlight as was available and their diets became impoverished. Rickets then became so prevalent as to call forth, in 1650,

*From the Children's Medical Department of the Massachusetts General Hospital and the Department of Pediatrics, Harvard Medical School.

Glisson's famous monograph on the subject[3], the first to be published in England. The presence of the disease, however, was already well appreciated, for its name appears in the Bills of Mortality, seventeen years before the monograph appeared.

The disease was extensively studied by various investigators including Virchow during the next two hundred and fifty years, but it was not until 1885 that Pommer[4] established its pathology on a firm foundation.

Since its early recognition in the time of Glisson, rickets has been the prevalent disease of infancy and young childhood, mostly in cities, and mostly in the cities of Europe and later of North America, and in India. In India its absence among the lower classes, who live on an insufficient diet, may be attributed to the fact that the women work in the fields and take their infants with them; its presence among the upper classes is due to "purdah" or the custom of keeping the women with their children permanently in darkened houses. Its prevalence among all domesticated animals except the cat, which refuses to be entirely domesticated, has been remarked upon by Park[1]. The situation has been stated tersely by Howland; "Man has domesticated himself—he has shut his children up in houses to their detriment and he has fed them upon a diet that allows rickets to develop."

The use of codliver oil as an antirachitic agent has been recognized for about a hundred years, for it was introduced into France for this purpose by Bretonneau (1778-1862) and popularized by the writings of Trousseau (1801-1867). Gay[5], in an interesting article on the subject, has traced the medicinal use of various fish oils for one purpose or another from the times of Hippocrates and Pliny, through its entrance into the British Pharmacopeia in 1771 until the present. Its known use in rickets by the Dutch medical profession in 1822, and case histories of rickets cured by codliver oil, published by Schütte in 1824, suggest the source from whence Bretonneau derived his knowledge of it.

PREVALENCE AND DISTRIBUTION

Rickets, as has been mentioned, occurs most universally and with most striking manifestations in northern civilized countries, such as Europe and North America, where lack of sunlight during the winter months is the rule, and in countries such as India where unusual conditions of domestication prevail. It does not occur in the native parts of Africa, and is rare in China and Japan, where, regardless of the density of population, much of the life is out of doors[1]. As Park has stated, savages may starve and they may become the victims of pestilence, but they do not develop rickets.

The high incidence of rickets in those countries where it is prevalent is brought out strikingly by the figures of Schmorl[6], based on necropsy findings. Schmorl, in a large series of routine autopsies, found histologic evidence of rickets in 97 per cent of the infants between the ages of four and six months.

Hess and Lundagen[7], commenting on the seasonal variations in the incidence of rickets, and using clinical signs, blood phosphorus and calcium determination and the X-ray as diagnostic criteria, came to the conclusion that 50 per cent of breast fed infants and probably most of those fed on the bottle are victims of rickets by the end of March. Hess[8] also finds rickets more prevalent among well than among poorly nourished infants which suggests the importance of the growth factor as an exciting or concomitant cause of the development of the condition. Certainly atrophic or marantic infants are notably unsusceptible to the disease. This factor will be referred to later.

The seasonal variation in the occurrence of rickets offers striking evidence in favor of the part that sunlight plays in the prevention of the condition. Hess and Lundagen[7], [9], commenting on the seasonal variation in the sun's spectrum, find that, coincident with the variation in the sun's rays, is a tide in the inorganic blood phosphates, reaching its lowest ebb in March. Calcium, although more stable, also varies, the peak of the incidence of tetany occurring a little later in the spring than that of rickets. After March, following the seasonal variation of sunlight, the inorganic phosphates of the blood begin to rise. The question may be raised if any of these subjects showing a calcium and phosphate tide were actually rickets-free. Clinically, Hess[10] has shown that the disease incidence of rickets rises as the abundance of sunlight and as the blood phosphates fall, one fourth of his cases developing in the second half, and three fourths in the first half of the year. In order to minimize the possibility of a dietary factor entering into his calculation, cases were fed on dried milk from pasture-fed cows, but the resulting incidence of the disease was as high as among those deriving their sustenance from winter-fed cows. For a realization of the importance of this observation it must be appreciated that what little antirachitic property cow's milk contains is not destroyed by drying.

ETIOLOGY

The causes of rickets in a broad and practical sense have been well recognized by clinicians for generations, as has been suggested in the introductory remarks. Rickets flourished under generally poor hygienic conditions, and especially under conditions where direct exposure to the rays of the sun was infrequent or entirely absent. With the awakening of the scientific sense, however; with an appreciation of the fact that many of Nature's laws could be put to the experimental test and proven, came a distrust of all observations, no matter how richly demon-

strated by experience, that had not been thus tested. As a result such observations fell into disrepute and so remained for a time.

A number of theories concerning the cause of rickets have been elaborated from time to time; some have become discredited; others still have their proponents. Owing to the possible effect of many factors, hereditary or environmental, that seem to be associated with the disease it is not difficult to imagine that many observers are reluctant to abandon their theories. Some theories, although not proven, cannot definitely be disproven as yet, moreover it is not unusual for evidence to be so conflicting or so variously interpreted as to lead to opposing conclusions.

Park has discussed a number of these etiological hypotheses: Glisson, observing that rickets was associated with the growing period, believed it to be the result of over-eating. Recently Jundell has revived this idea, for no theory is ever quite disposed of. Heitzmann believed that the disease was due to an acidosis which caused a decalcification of the bones, and has his modern supporters in Klose and Vogt and Pritchard. A number of French clinicians have believed that rickets is a manifestation of congenital syphilis or auto-intoxication. Others have held that rickets is inherited, that it is the result of disturbances of the endocrine glands, or that it is the result of infection, and have advanced evidence in support of their hypotheses. None of them seem to have established their points.

Findlay[11], supported by Galbraith[12] who believes that loss of muscular tone is the important factor in the disease, heads the Glasgow school which continues to emphasize lack of fresh air and exercise as the chief causes of the condition. Findlay believes, and many are humble enough to agree with him, that we do not yet understand the real cause of rickets. He further holds to the belief that skeletal changes, while the most marked, are not the only changes associated with rickets, and recognizes at least five vital factors; namely: sunlight, exercise, vitamine X (the antirachitic factor in diet), calcium and phosphorus. He admits the ossifying power of codliver oil but does not believe that it cures the rickets. Thus Findlay, while recognizing the existence of these factors on which the American school has placed its greatest reliance, relegates them to the side lines and sends into the game players that we have come to consider as of second string value only.

The present re-awakened international interest in the study of rickets received its greatest impetus, after all, with the experimental production of rickets in puppies by Mellanby[13]. Mellanby succeeded in the production of rickets by the use of a diet lacking in a so-called accessory factor. The addition of this factor to the diet cured the rickets. Owing to the fact that it seemed to occur most abundantly in codliver oil, Mellanby stated that it was *probably* vitamin A. It remained for the Medical Research Council to make the mistake of unequivocally identifying it as vitamin A.

It soon became the province of American investigators to establish the importance of the role played by calcium and phosphorus in the pathogenesis of rickets. McCollum and his coworkers[14, 15] demonstrated that diets producing rickets in rats must have a disturbed calcium-phosphorus ratio; that is, that they must be deficient either in calcium or in phosphorus, and that the antirachitic factor and sunlight must be lacking. In explanation of this, Orr[16] and his associates advanced the theory that excessive amounts of calcium in the diet tend to increase the total absorption and retention of calcium, but to impair the phosphorus retention. Excessive amounts of phosphorus, on the other hand, exercise an unfavorable influence on calcium metabolism, and are accompanied by an increase in the calcium lost in the feces. These phenomena are explained on the basis of a formation of insoluble phosphates of calcium which cannot be absorbed.

Howland and Kramer[17, 18] conclude that when the product of the calcium and inorganic phosphate in the blood serum expressed in mgm. per 100 c.c. of serum reaches 40 or more, rickets never results. When the product is less than 30 rickets always results, and when it is between 30 and 40, the degree is slight or healing may occur. Due to these earlier investigations into the role of calcium and phosphorus a veritable avalanche of data has resulted. Tisdall[19] found the calcium and inorganic phosphorus in the serum of a number of infants with craniotabes and slight enlargement of the costochondral junctions to average 8.8 mgm. of calcium and 6.1 mgm. of phosphorus per 100 c.c. of serum. The average values found in normal infants were 10.5 and 5.4.

Shipley, Park, McCollum and Simmonds[20] suggest the probability of two main kinds of rickets; a low phosphorus rickets with approximately normal calcium, and a low calcium rickets with approximately normal phosphorus. Tetany, they believe, is an expression on the part of the nervous tissues of an insufficiency of the calcium ion; rickets is an expression on the part of the skeletal tissues of a disturbed relationship between the calcium and phosphorus ions of the body fluids. Tetany is frequently associated with rickets because in rickets the calcium ion in the body tissue and fluids is subject to variations; tetany may occur independently of rickets, but is essentially associated with the low calcium form. The possibility of a true renal rickets is also suggested, and that the rickets accompanying the alimentary anemias may represent a somewhat different kind of disturbance in metabolism from that which is present in the ordinary form of the disease.

The importance of the growth factor in the etiology of rickets is brought out by Cavins[21],

who found that fasting of rats rendered rachitic by a low phosphorus diet caused healing with a rise of blood phosphorus, and that refeeding rendered the process active again.

Jones[22] in a recent publication expresses the belief that the beneficial effects from codliver oil and sunlight may be due to stimulation of general metabolic processes, and indirectly the readjustment of the acid-base balance in the body. Her theory is based on the observation that puppies developed rickets on a diet adequate in every way except for a relatively high potential alkalinity. She was unable to parallel her experiments with rats. The addition of hydrochloric acid to the diet cured the rickets in the puppies and in three clinical cases.

Various observers have attempted to establish a relationship between maternal and fetal blood and the inorganic phosphate content of breast milk. Hess and Matzner[6] found the inorganic phosphate of the mother's blood almost invariably lower than that of her infant at birth, and that of the newborn infant lower than that of infants one month of age or older. No relationship was found between the percentage of inorganic phosphate in the blood of the newborn and the occurrence of rickets during the first year of life. According to Hess and Weinstock[23] rickets cannot be prevented by improving the diet of the mother previous to pregnancy, during pregnancy or throughout lactation, although it can be mitigated to a certain degree. Infants were not protected from rickets by giving the mother codliver oil during the last two months of pregnancy. Following a similar line Von Meysenbug[24] found no reduction in the inorganic phosphate of the breast milk on which infants developed rickets.

Hess[25] agrees with other observers that rickets can be produced in rats by a diet adequate in calcium, but lacking in phosphorus, and finds that, although osteoporosis develops frequently in spite of the addition of an adequate amount of phosphorus, rickets is always absent.

Osteoporosis is a condition that has doubtless frequently been confused with rickets, since very early craniotabes is unquestionably often osteoporotic rather than rachitic in nature. One possible explanation of the etiology of osteoporosis is offered by Shipley, McCollum and Simmonds[26], who believe that it is brought about by a diet lacking in vitamin A, although rich in antirachitic factor. There is some evidence that osteomalacia, on the other hand, may be intimately associated with rickets if not, indeed, identical with it, since Hutchison and Stapleton[27] found that among Mohammedan women in India practising "purdah," and among Hindu woman, who, although not subject to purdah, nevertheless staid closely indoors, osteomalacia resulted regardless of pregnancy.

The influence of certain agencies such as light rays and the antirachitic factor are so closely bound up with any consideration of rickets that they have been mentioned of necessity in the preceding pages. These factors also have been susceptible of scientific demonstration and their importance has been definitely established.

Hess[25], [28] has shown that heliotherapy, with the unfiltered rays of the sun impinging directly on the skin, results in a clinical cure of rickets with an increase in the inorganic phosphorus of the blood. He furthermore finds that the effectiveness of radiation depends on three factors; diet, the rate of growth, greater antirachitic protection being required when the rate of growth is rapid; and the intensity of the pigmentation of the skin. Black rats are much more difficult to protect than are white rats, and the same holds true with colored and white infants.

Other experimental work has been undertaken by Hess[10], and Hess and Weinstock[29] in an attempt to establish the identity of the protective rays. Using standardized glass filters it was found that these rays are in the ultraviolet zone of the solar spectrum, and are 300 millimicrons in length or shorter. Pyrex glass is markedly permeable to the short ultraviolet rays and does not interfere greatly with the protective action of the rays. Wearing apparel filters the rays and prevents protection according to its thickness and the penetration of the rays through it. Color is also an important factor, black clothing cutting off the ultraviolet rays entirely.

The mercury vapor quartz lamp has been found to be one of the most satisfactory substitutes for the direct rays of the sun, as has been proven by numerous investigators. Powers et al[30], [31], using rats which had been rendered rachitic, found that the effects of the radiations of the mercury vapor lamp on the growth and calcification of the skeleton and on the animal as a whole seem to be similar if not identical with those brought about by direct sunlight and by codliver oil. Similar results have been obtained by Orr[32] and his co-workers, who have also demonstrated the retention of large amounts of calcium and phosphorus in the body following ultraviolet ray therapy.

Experimenting with the white flame carbon arc lamp, Hess and Unger[33] have found that this source of radiation more nearly approaches the sun's spectrum than does the mercury vapor lamp. Moreover, it does not produce superficial burns, does not cause tanning, and is free from the dangers of over exposure. Exposures were made for half hour periods at three feet distance in one group of cases, and in another group for one to two hours at nine feet distance. Healing of rickets, which frequently took place after two weeks of treatment, was evidenced by X-ray signs and a rise in the blood phosphorus. Hess, Unger and Steiner[34] have shown that exposure to the roentgen ray has no curative effect on rickets.

The antirachitic or "X" factor as contained in foods and especially in codliver oil is the second great agent in the prevention and treatment of rickets. This value, recognized clinically for a century, has in the last few years been established on a firm scientific basis. Mellanby recognized the effect of codliver oil in curing his puppies but concluded that the effect was in all probability due to fat soluble vitamin A. Later experiments in the destruction of the vitamin A by oxidation without impairment of the antirachitic factor showed that these factors, although associated, are not identical. As Park has said, "If Mellanby and the committee of the Medical Research Council which supported him can be accused of 'barking up the wrong tree,' they at least deserve the great credit for having 'barked up a tree' which stood close by the right one."

Park, Guy and Powers[35], experimenting with white rats, showed that codliver oil added to the diet enabled the body to hold and assimilate lime salts. The similarity between its action and radiant energy was noted. Similar results have been repeatedly noted by other observers. Knowledge concerning the distribution of X in foods is limited. Park states that it is present in large amounts in the oil of the cod and in a considerable amount in the oils of the shark and burbot. It is present in small amount in butter fat, and butter fat cannot be considered as protective. It is ecntained in cocoanut oil, but other vegetable oils studied appeared to be free from it. Shipley[36] found that ether, alcohol and acetone extract from alfalfa leaves an antirachitic substance and that extracts of alfalfa meal with boiling water are antirachitic. The antirachitic factor was also extracted from clover blossoms by ether. Such experiments would seem to indicate that X occurs naturally in the vegetable world and is stored in certain animal oils and fats. Thus Hess[37], Casparis, Shipley and Kramer[38], and Hess and Matzner[39] have demonstrated the antirachitic influence of egg yolk, finding it protective and curative, although less so than codliver oil.

Some interesting, although as yet unconclusive, studies have been made in an attempt to find a common meeting ground for two such apparently dissimilar agencies as radiant energy and the X factor. Hess and Weinstock[40] apparently rendered cotton seed oil and linseed oil antirachitic by irradiating it with the ultraviolet ray, and failed with liquid petrolatum. Kugelmass and McQuarrie[41], using photographic plates sensitized to the ultraviolet ray, appear to have demonstrated that antirachitic substances emitted the ultraviolet ray after alkalinization and oxygenation.

DIAGNOSIS

The diagnosis of rickets when the symptoms are well marked and the signs clear cut should not be difficult. Restlessness, irritabilty, head sweating, delay in standing and delayed dentition are classical observations, as are flabby musculature with a resulting pot belly and constipation and frequently a palpable liver and spleen. A secondary anemia is often found. Most striking, however, are the skeletal changes, consisting in enlargement of the radial and tibial epiphyses and of the costochondral junctions and, in general, rarefaction of the long bones resulting in bowing of the legs; the so-called Harrison's groove corresponding with the insertion of the diaphragm; flaring of the ribs below this groove, and other chest deformities. The cranial signs of rickets are noteworthy. During the active stage the tables of the skull may be softened, giving rise to the "buckling" on pressure, of craniotabes, which may be confined to sharply localized areas, and should be regarded as a doubtful sign if occurring at too early an age or too near the suture lines. The "square head" with prominent bosses may also result as may a mild degree of hydrocephalus and other deformities. Utter[42] has remarked on a change in the percussion note over the parietal bones in active rickets.

Milder degrees of rickets may often be overlooked, however, and conditions other than rickets may give rise to an erroneous diagnosis of the disease.

Hess and Unger[43] have recently analyzed the significance of various signs in the diagnosis of rickets. Head sweating, inability to stand or sit at the proper age, delayed dentition, poor muscular tone and craniotabes they consider as unreliable signs. Beading of the ribs they found to be the most constant and reliable sign, appearing before the diagnosis could be made by X-ray findings in 104 out of 118 cases. They accept 3.75 mgm. or less of inorganic phosphorus per 100 c.c. of blood serum as being in the rachitic range, but found that the phosphorus was often not diminished in clinical rickets, and in some cases with a diminution in the blood phosphorus no rachitic signs were found after long observation.

Softening of the ribs and of the anterior thoracic wall due to osteoporosis has also frequently been found by Hess[44], and is not considered as a sign of rickets. This most often occurs in atrophic rather than in well nourished infants, and is found in the newborn and especially in premature infants. It is not benefitted by codliver oil or ultraviolet radiation.

Barenberg and Bloomberg[45] have also attempted to determine the significance of craniotabes and bowing of the legs, accepting the inorganic blood phosphorus and X-ray examination of the epiphyses as criteria of diagnosis. These investigators, after a study of 289 infants over a long period of time, conclude that softening of the skull under 4 months of age is generally not due to rickets, since of 68 cases under this age exhibiting craniotabes only one showed

rickets roentgenographically, and only one had a blood phosphorus within the rachitic range. After 4 months of age craniotabes is accepted as a diagnostic sign of rickets. Fourteen of their cases, moreover, showed bowing of the legs who at no time manifested any other evidences of rickets.

The head and chest, according to Moore[46], furnish the first skeletal evidence of the disease. Craniotabes, determined most easily at the mastoid fontanel, occurred in 60 per cent of his winter babies, and is taken as evidence of rickets, although, if we adopt the criteria of Hess, it is doubtful if such evidence should be accepted. Genu valgum and genu varum Moore found to be preceded by an abnormal lateral motility of the knee joint, and he devised an apparatus for measuring this motility.

A study of 1271 cases admitted to the Children's Medical wards of the Massachusetts General Hospital during the four years 1921-1924 reveals a diagnosis of rickets made on 123 cases, or 9.67 per cent. It must be emphasized that these diagnoses were made as a result of routine examinations by numerous individuals not having rickets especially in mind, and with no especial attempt made to find the earliest manifestations of the disease. The ages in this group varied up to 10 years, and all diagnoses of rickets, active or healed, are included.

The variance in the incidence of rickets in this group as compared with that reported by Hess is not surprising and is probably explained in two ways; first, by the ease with which mild rickets may be overlooked if the diagnostic signs are not especially sought; secondly by the fact that the signs of mild rickets probably often disappear with advancing age of the child. Seven of these cases were three months or under and sixteen were over two years of age.

They have been analyzed from various clinical angles.

SEX

	No.	Per cent
Male	75	60.9
Female	48	39.1

DURATION OF BREAST FEEDING

	No.	Per cent
Never	24	19
Two months or less	43	34.9
Six months or over	28	22.7
One year or over	15	12.2
Until admission to ward	7	5.7

INCIDENCE OF COMPLICATIONS

	No.	Per cent
Respiratory infections	64	52
Tetany	14	11.3
Scurvy	6	4.8

INCIDENCE OF DIAGNOSTIC SIGNS

	No.	Per cent
Beading of ribs	108	87.8
Epiphyseal enlargement	63	51.2
Enlarged cranial bosses	54	43.9
Harrison's groove	39	31.7
Craniotabes*	30	24.3
Palpable spleen	17	13.8
Abnormal joint motility	1	0.8

The most interesting feature to be brought out by such an analysis are the ineffectiveness of breast feeding as a protection against rickets, the high incidence of respiratory infection, and the relative incidence of various diagnostic criteria, beading of the ribs apparently being the most important, as suggested by Hess.

PATHOLOGY

A comprehension of the bone pathology of rickets is necessary for a clear understanding of the clinical signs as well as for roentgen ray interpretation. An able study of the anatomic basis for interpreting the roentgenogram has been made by Weech and Smith[47]. According to these authors, in growing bone the trabeculae are constantly being resorbed by osteoclasts and replaced in changed form by osteoblasts. Normal bone is composed of two parts inorganic to one part organic matter, but in rickets, where the process of calcification is interfered with, the ratio is reversed. Diaphyseal elements, such as blood vessels and the surrounding osteoid and connective tissue invade the epiphysis in a lawless fashion with a resulting wide area between the epiphysis and diaphysis which is deficient or entirely lacking in lime salts.

When healing begins, there is first a deposition of lime salts between the cartilage cells in the epiphysis; the new line is broadened, osteoid tissue is ossified, and the bone becomes normal. With recurrences of the disease the new epiphyseal line will be broken through by marrow elements and thus there may occasionally be found two or three buried lines of calcification. The thickening of the extremities of the bones is due to mushrooming of the end of the shaft where it is most deficient in calcium, and to functional thickening to meet the demands for strength.

Roentgenographically we find general rarefaction with disappearance of the sharp boundary of the diaphysis and fading away of the shaft into the cartilage. With the onset of healing a definite line, sometimes double because it is the boundary of a surface, appears on the epiphyseal side of this fringe. The end of the bone in active rickets may appear cupped, the cortex laminated, and the periosteum thickened and lifted from the cortex in a close resemblance to the findings in syphilis.

*Of the cases exhibiting craniotabes one was two months of age, the rest three months or over. The oldest was 19 months.

AGE INCIDENCE

Rickets occurs most frequently during the second half of the first year of life, or the first half of the second year. Late rickets may occur during the period of secondary growth; that is from the fourteenth to the seventeenth year[8], and as Hutchinson and Stapleton have mentioned, probably bears a relationship to osteomalacia. The occurrence of rickets in utero has been discussed by Park[1], and the evidence seems overwhelmingly against it. The earliest age at which Schmorl found evidence of rickets was one and one-half months, although recently Dunham[48] has reported a case in an infant of thirty-four days. In the author's series of cases from the Massachusetts General Hospital, two were two months of age.

Infants born prematurely seem peculiarly susceptible to rickets, Park stating the belief that the majority of premature infants, in the countries in which rickets is prevalent, develop the disease whether breast or artificially fed. Since a storage of calcium takes place in the fetus during the last three months of intrauterine life and this store is drawn on during the first few months after birth, and since the infant prematurely born is deprived of a large part of this store, Hamilton[1] suggests that the frequent occurrence of rickets in the premature may be caused by a deficiency in calcium and possibly of phosphorus.

SEQUELAE AND COMPLICATIONS

The sequelae of rickets are mainly due to the bony deformities left after healing occurs and are problems for the orthopedic surgeon, and, in the case of rachitic pelvis, for the obstetrician to deal with. The problems of dentition are less clearly understood, but unmistakably exist. As is well known, rachitic infants are peculiarly susceptible to infection, and infections are largely the direct cause of rickets mortality. Infantile scurvy, when it occurs, is almost always against a rachitic background, the dietary and hygienic deficiencies causing scurvy being almost certain to promote rickets as well.

Tetany is an important and frequent enough accompaniment or phase of rickets to deserve special consideration. Disregarding the question of its identity as merely a symptom of one form of rickets, tetany unquestionably occurs almost always as an accompaniment of rickets, as a result of the same general causes, and responsive to the same form of treatment. Hess et al[49] found that severe rickets was present in 40 per cent of their cases of tetany, and that with tetany the blood calcium was reduced, with or without a reduction in phosphorus. They believe that rickets and rickets associated with tetany represent two phases of the same disorder. Hoag[50] proved conclusively that ultraviolet radiation will cure clinical tetany with an accompanying rise in blood calcium, even more rapidly than will codliver oil, although codliver oil produced the same result. Hess[8] quotes György who regards tetany as due to an alkalosis, and Babbott, Johnston and Haskins[57] found a lowered gastric acidity and diminished gastric emptying time in manifest infantile tetany, with a rise to normal coincidental with that of the serum calcium.

Among the most noteworthy contributions on the subject of tetany have been the studies made by Gamble and his co-workers[52, 53] on the effect of hydrochloric acid-forming substances on the acid-base equilibrium. The ingestion of calcium chloride, on account of the relatively greater absorption of the chloride ion than of the calcium ion, was found to act as does an acid substance, with an increase in the excretion of phosphates and fixed alkali in the urine, and early relief of symptoms, due to increased ionization and availability of calcium. The same effect was obtained with ammonium chloride and hydrochloric acid. Falkenheim and György[54] emphasize the necessity of combining the direct treatment of tetany by means of a chloride with radio-therapy, as they have found that in the treatment of tetany by the mercury quartz lamp a latent tetany can become active, and manifest tetany aggravated before the cure takes place.

PRACTICAL CONSIDERATIONS

Much work has been done to uncover the secret processes which cause rickets to manifest itself, and much has been written on the subject. Nevertheless, for all practical purposes, our knowledge concerning its causes and our knowledge concerning its control are much as they were a century ago, for they were very complete then, in their fundamentals. Sunlight and its substitutes and codliver oil and its substitutes will prevent rickets and cure the disease once it has become evident, but to use a homely adage, an ounce of prevention is worth a pound of cure.

We have learned much concerning the pathogenesis of rickets and the factors which cause it to appear, and we have much still to learn. The production of experimental rickets and a knowledge of its body chemistry have given us a deeper insight into its mechanism so that we may apply intelligently the remedies that we possess. Neither woman's milk nor cow's milk will protect the growing infant from rickets. The ultraviolet lamp, the direct rays of the sun, codliver oil and egg yolk will protect. The ultraviolet lamp is rarely available for large numbers of infants; the sun's rays are often unavailable; codliver oil and egg yolk are practically always available, and some one of these agents should be employed daily, at least after the first month of life. Codliver oils may vary in their potency, as has been previously pointed out by the author[55], and an oil of known value should be used. Three drams a day is not a large dose for a young infant, and

in premature cases it might be well to supplement this with calcium and phosphorus. Where rickets is complicated by tetany the antirachitic treatment should always be supplemented by calcium chloride or hydrochloric acid for the immediate relief of symptoms. It must, however, be remembered that this alleviates only; the real cure must come from continued antirachitic treatment. Little fear need be felt concerning the infant's ability to digest the added fat of the codliver oil, for Deuel and Holmes[56] have shown its cöefficient of digestibility to be ahead of any other oil so tested. In cases where it does not seem to be well borne egg yolk may be substituted, and there is already some evidence that its application by inunction may be efficacious.

Man has always shown a tendency to live contrary to Nature's laws to his detriment. Civilization has opened Pandora's box, and continued civilization must find the proper measures to alleviate the miseries that issued from it. The time is coming when rickets should be unknown among intelligent people.

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ACID MILK IN INFANT FEEDING

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THE use of acid milk in infant feeding has recently received a great stimulus by the work of Marriott and Faber in this country, one using lactic acid milk and the other hydrochloric acid milk. Recently, Hess has added another acid to the milk, namely citric, in the form of lemon juice. In order to find out the relative value of the different acid milks, it was decided to use nothing but acid milk on one of the services on the Boston Floating Hospital this past summer.

It would be well to review the literature concerning the theory of acid milk. Various foods, especially cow's milk, have the property of binding large amounts of acid and converting the hydrogen into a non-ionized form. Much of the hydrochloric acid is thus rendered inactive. Hence, to get an idea of the effective acid concentration it is necessary to determine the H-ion concentration at the height of digestion after a regular feeding. According to the work of Faber, Marriott and others, PH5 is the threshold which gastric acidity must reach before any of the ferments, except rennin, may become usefully active.

Cow's milk has a high buffer content. "Buffer substances" are substances capable of uniting with considerable amounts of acid or alkali without undergoing a great change in chemical reaction. These substances are present in much larger numbers in cow's than in human milk—they exist in the form of phosphate and calcium caseinate. Of the total number 1/3 are in the

whey and 2/3 in the curds. To get a threshold acidity of PH5 we must add to 100 c.c. of cow's milk 50-60 c.c. of one-tenth normal acid, while to human milk we must add the equivalent of but 15-20 c.c. of tenth normal acid. The reduction of buffer was formerly done by dilution or the use of bacterially soured milk. Experimental evidence has shown that marked variations in gastric acidity occur, and that in general a decrease in acidity is likely to be associated with nutritional and gastro-intestinal disturbances. A larger portion of the feeding remains in the stomach at the end of two hours in the case of infants with a deficiency in gastric acidity than in those with an acidity approximating that of normal breast fed infants. A definite deficiency in the gastric secretion was found by some observers in infants ill with various infections or suffering from malnutrition.

The method of eliminating the buffers of milk by saturating the buffer with acid is now being brought into use. This is equivalent to augmenting the acidity of the gastric juice. Hydrochloric acid seems to be the natural acid to add. However only limited amounts can be safely added, as it is not destroyed in the body but must be eliminated by the kidneys. This leads to a severe strain on the acid-base regulatory mechanism, and may produce acidosis.

Faber who worked on hydrochloric acid milk modifies the reaction and buffer value of cow's milk by adding (one-tenth of the normal hydrochloric acid 0.4%) 25 c.c. of one-tenth normal hydrochloric acid to each 100 c.c. of milk. This

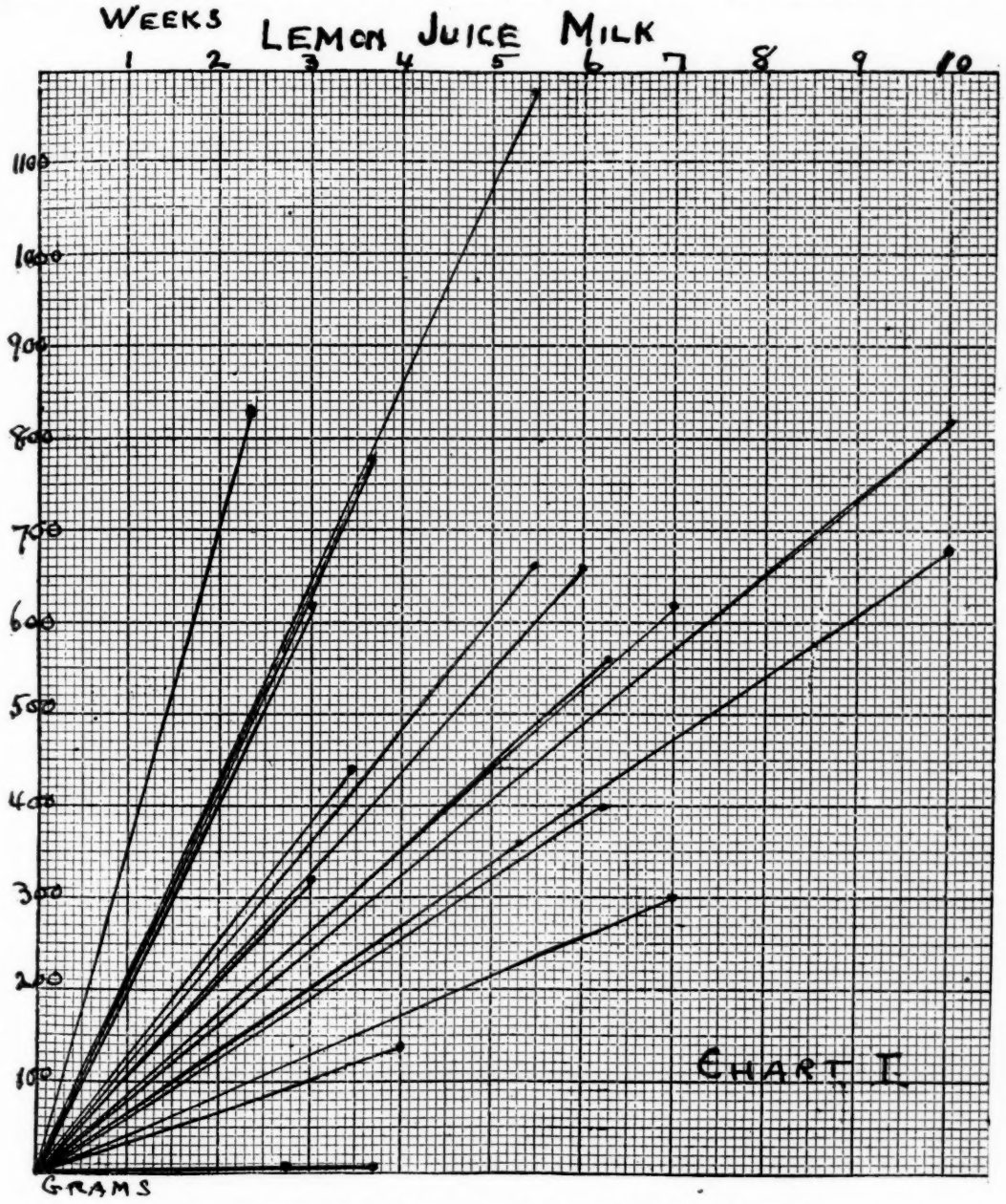

Chart shows gain in weight on lemon juice milk during stay in hospital.

reduced the buffer value approximately to that of human milk; the resulting mixture having a sour taste, PH5, and a heavy flocculation of casein.

Milk thus modified is thought to be more nearly physiological than that with more acid, since it demands from the stomach about the same secretory tasks as does breast milk. It is taken without protest, has no free acid present, and increases the tolerance for fats. This milk is not to be used before 6 weeks, as in younger infants there is less gastric and more intestinal digestion than later, the latter being optimal in an alkaline reaction. Hydrochloric acid according to Jones has some anti-rachitic properties. Babies fed on this milk showed a marked deposition of calcium at the epiphyseal line in a short time. Furthermore hydrochloric acid may work in this way to prevent tetany, that is, that it allows more Ca to be ionized, hence available, and can be used in place of large doses of calcium chloride.

LACTIC ACID MILK

Organic acids do not seem to be open to the same objection mentioned above in regard to hydrochloric acid, since they are oxidized in the body. Lactic acid serves well and in reasonable amounts has no harmful results. Acetic, citric, and butyric acids tend to cause diarrhea, according to Marriott. The organic acid of choice is lactic. The amount ordinarily found in buttermilk is just sufficient to saturate the buffer substances of milk to such an extent that the additional acid required to bring the hydrogen ion concentration to the normal average of the gastric contents. (PH 3.8) is exactly the same as in the case of breast milk.

As good results have been obtained by feeding sterile cow's milk acidified by the addition of lactic acid (0.5 to 0.7%) as from buttermilk. Such milk may be fed undiluted to even young babies. This method of rendering milk digestible possesses a distinct advantage over the dilution method, in that more milk, and therefore a larger amount of food, may be administered, thus increasing the concentration.

The milk may be prepared in the home by the use of lactic acid cultures. A better method consists in the addition of lactic acid to sterilized milk. The milk after sterilization is cooled and the scum removed. When thoroughly cold, the lactic acid is dropped in slowly while the milk is gently stirred. Lactic acid USP which has an acid content of 75% to 85% is used, and the amount required is one dram to each pint of milk. When properly prepared, a smooth homogeneous preparation should result.

The concentration of acid is the same as that occurring in ordinary buttermilk, the taste and general physical properties are the same. The milk keeps well, even if not placed in a refrigerator. It has an acidity of PH4, which is such that bacterial growth is almost entirely inhibited. Carbohydrate should be added to lactic acid milk, as the amount of sugar present is not sufficient for the needs of the average infant. The carbohydrate of choice is the commercial corn syrup, which contains a relatively high proportion of fermentable dextrin, and can therefore be added to the lactic acid milk feedings in large amounts without the danger of producing diarrhea. The amount of syrup usually added to the day's feeding is one ounce for infants up to two weeks of age and from one and a half to two ounces for older infants. Somewhat larger amounts may be added in the case of infants with high caloric requirements, especially those who are undernourished. This summer we have been adding two to four ounces. Such infants are able to take a surprisingly large amount of syrup without developing diarrhea.

LEMON JUICE MILK

Alfred Hess of New York has obtained good results using a mixture of whole milk, sucrose and lemon juice. He began by using orange juice, but substituted lemon juice in the formula because the orange juice was found to be insufficient in acidity except in very large amounts. The use of lemon juice was resorted to as it has a PH of 2.12 and contains from 6-7% citric acid. Titration showed it to be even stronger than normal hydrochloric acid with a marked effect in overcoming buffer action. The PH is unaltered by boiling.

In preparing the milk mixture the lemon juice is added to the water or other diluent and this in turn is added to the milk. If undiluted milk is used, the lemon juice is added drop by drop, the mixture being stirred constantly. This results in a PH of 5.4 for whole milk. When milk forms only two thirds of the formula, the remainder being composed of sugar and water, we get a slightly higher acidity of PH 5.3. The standard formula used was 24 ounces of whole milk, 12 ounces of boiled water, sucrose one-half ounce and lemon juice 21 c.c. The lemon juice causes but little change in the consistency of the milk, giving it a pleasant, slightly acid flavor. In no case did the change from non-acidified milk lead to a refusal of the food or cause a digestive disturbance. Lemon juice can be added directly to cow's milk without producing curdling.

Infants who received milk prepared with lemon juice thrived well for a long period. One advantage in using lemon juice in preference to lactic acid or hydrochloric acid is that the former also supplies antiscorbutic vitamines, thus compensating for the deficiency of this essential factor in the milk. Egg yolk can be combined with this mixture with but slight alteration in the hydrogen-ion concentration. We have used egg yolk but not combined with the milk, as Hess has suggested.

In our series of cases, the babies were fed on

some form of acid milk for a period varying from 2 weeks to two months. There were 70 cases in all divided into 4 groups, 18 were fed on lemon juice milk, (see chart one) 35 on lactic acid milk, (see chart 2) 6 on hydrochloric acid milk, (see chart 3) 11 on thick cereal feedings (see chart 4) made up of lactic acid milk and imperial granum or farina. The infants varied in age from 3 weeks to 17 months. The cases were referred to the hospital for failure to gain, malnutrition or vomiting. In other words all the babies had a bad feeding history.

Of the 18 babies fed on lemon juice milk, practically all took the mixture readily and gained well. Most of the cases which had either shown gastric disturbances before being placed on the mixture, or had a history of frequent vomiting prior to admission, were entirely relieved of their symptoms. It was interesting to note how readily this form of acid milk was taken in preference to another less palatable feeding which was either refused entirely or taken poorly. Orange juice was omitted in these cases as sufficient antiscorbutic vitamine was furnished by the addition of the lemon juice to the mixture. The stools were uniformly good, yellow in color, rather soft and had a faintly sour odor. They greatly resembled the breast milk stool in appearance. Their reaction was alkaline in practically all of the cases, though at times an acid

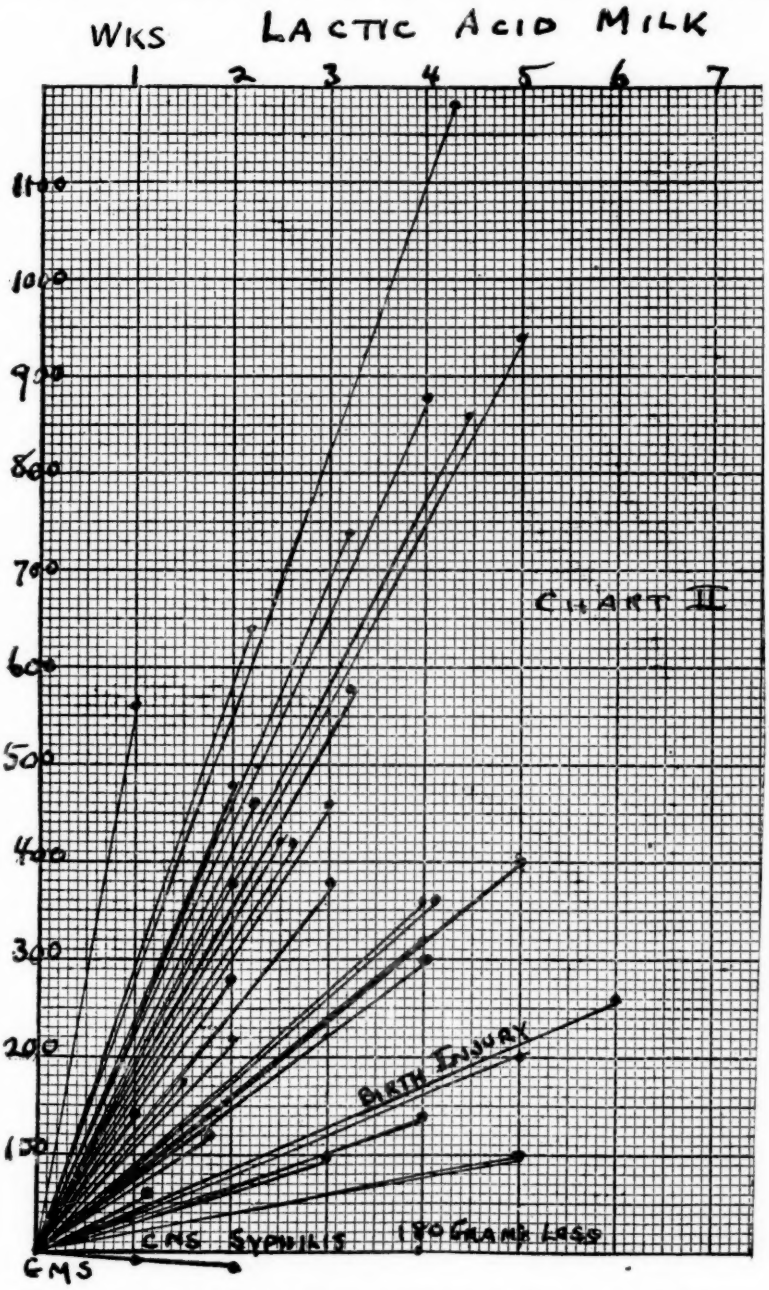

Chart shows gain in weight on lactic acid milk during stay in hospital.

stool was found. Many of these infants who had shown frequent loose stools prior to the interval of feeding of lemon milk improved greatly in this respect. The stools as a rule varied in number from 2-3 per day, even when the composition of the formula showed 10-12% carbohydrates. However, several of the babies who were receiving such a high % of sugar did show an increased number of stools although the stools were of good consistency and were essentially of the same appearance as when of normal number. Much variation was experienced in this regard and it was necessary to modify formulae in individual cases.

The percentage composition of the lemon milk mixture varied as follows: fat 2.2-2.8, carbohyrate 8.25-12.5 and protein 2.2-2.5. It will be noted that in many of the cases, a much higher percent of sugar was employed than was indicated in the original standard mixture suggested by Hess. A report of the progress of these infants at varying intervals following discharge shows a continuance of the good results. In consideration of the class of mothers with which we had to deal, it was deemed inadvisable to discharge the infants on a formula looked upon with suspicion not only by the mother but also by her physician except in a limited number

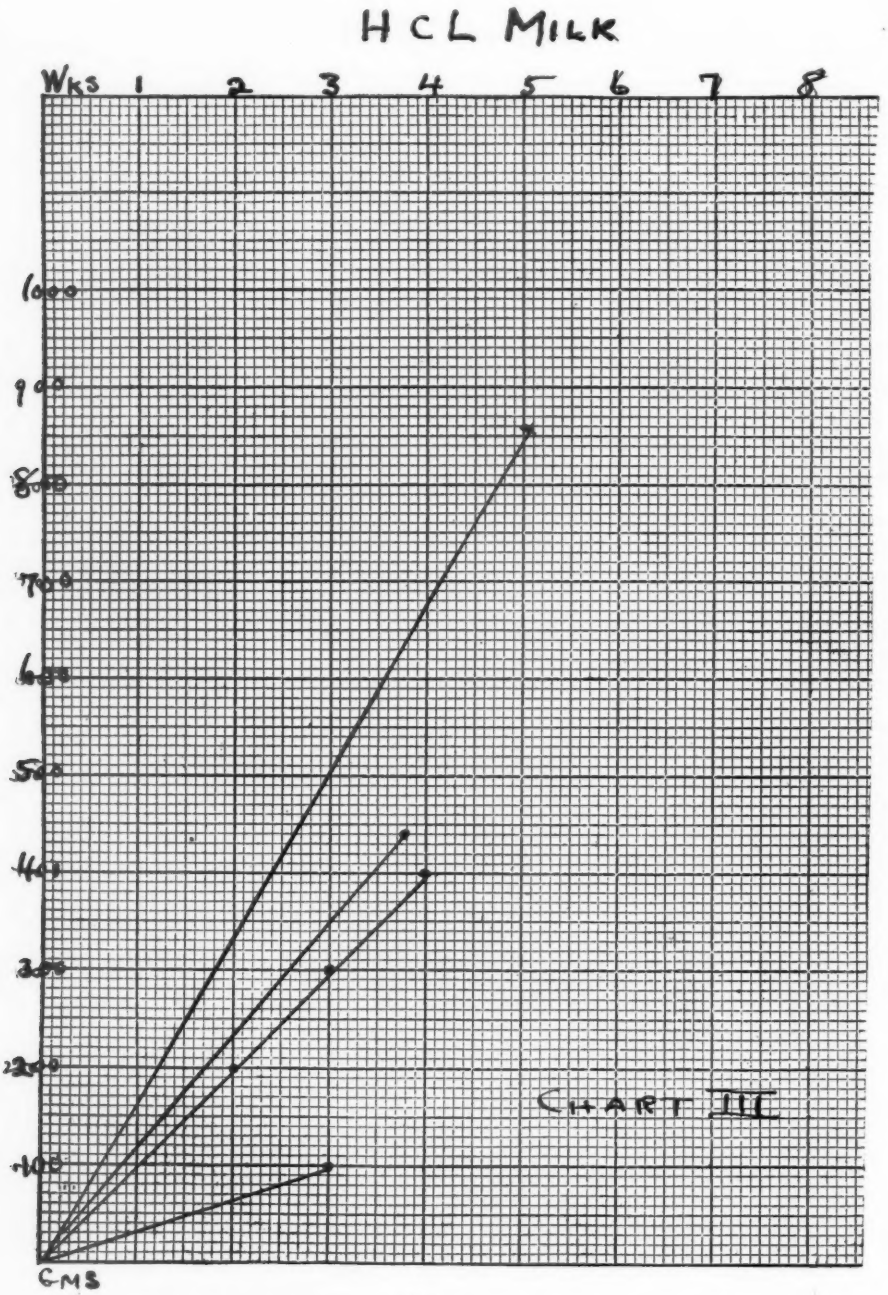

Chart shows gain in weight on Hydrochloric acid milk during stay in hospital.

of cases where the intelligence of the family and suitable home conditions made this procedure feasible.

In general the results with lemon juice milk have been quite satisfactory and particularly in the cases in which difficulty was encountered in feeding other formulae.

In the next group of cases 35 infants were fed on lactic acid milk with equally satisfactory results. In this series a considerable proportion of the babies came in with a bad diarrhea with varying degrees of dehydration and acidosis. Following the first few days of treatment of the marked symptoms the majority of these infants were given lactic acid milk, at first fat free and later changed to whole lactic acid milk to which corn syrup was added gradually in increasing amounts. Some of the babies, when this form of milk was begun, appeared to dislike it and it was necessary to force the feeding for 2-3 days. In one or two cases it was necessary to change to another feeding entirely on account of the persistent distaste for lactic acid milk. However most cases in this group took the food eagerly and straightened out rapidly; particularly after a greater degree of palatability had been obtained with the addition of corn syrup. Gain in weight was steady and satisfactory. About

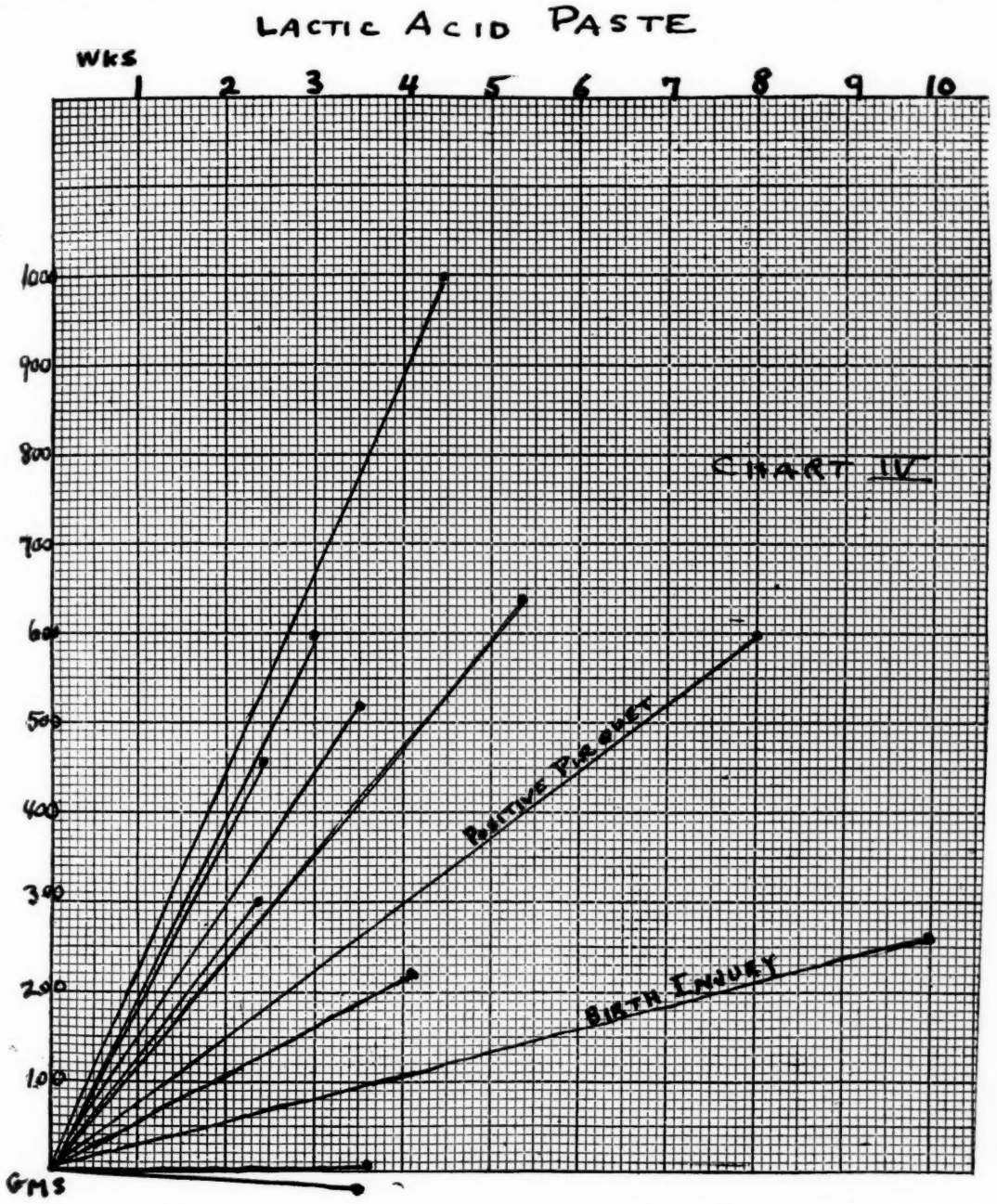

Chart shows gain in weight on lactic acid paste during stay in hospital.

half the cases on lactic acid milk exhibited some form of parenteral infection during their stay in the hospital, chiefly otitis media and upper respiratory infection. As far as possible no attempt was made to change the feeding in these cases and the wisdom of such a course was plainly seen by the continued satisfactory progress following the subsidence of the brief period of vomiting and loose stools. It appears that infants suffering from various digestive disturbances of an acute nature are more rapidly brought to a normal state with lactic acid than with any other acid milk employed.

One case, C. G. 10 mo., before admission had been on a formula of whole milk water and dextrimaltose, vomited frequently and gradually lost weight. After 12 days she was given fat free lactic acid milk. On this she no longer vomited, but continued to lose weight, 2 days later she was given whole lactic acid milk, on which she gained rapidly without any evidence of gastro-intestinal disturbance. Corn syrup and solid food were gradually added to the diet with satisfactory progress.

Hydrochloric acid milk was given to a group of 6 infants ranging in age from 4-10 mos. The acid was present as 1/10 up to 25% normal of the total volume. In all the cases the feeding was well taken and no disturbance occurred. Four of the babies gained rapidly and the remaining two, slowly. One case, one of a pair of twins, gained well and more rapidly than its twin which was on lemon juice milk. In 4 of the cases following the use of HCl milk, the babies were free from the occasional vomiting which marked the preceding period of 1-3 weeks when they were on straight milk, water and sugar formulae. While all of this small group did rather well, there was tendency to moderate excoriation of the buttocks, though without the appearance of frequent or loose stools. In the case of this type of milk, the stools rather closely resembled those of infants on lemon juice milk. The reaction of the stools of the former was more often acid.

Eleven infants ranging in age from 3 weeks to 6 months were fed on thick paste feedings made from lactic acid milk with farina or imperial granum. All had been started on liquid feedings of lactic acid milk but because of persistent vomiting they were given the paste feeding. Three of these were definitely cases of pylorospasm. One of them had visible peristalsis. All the babies did well, gaining rapidly in weight following the cessation of vomiting. Lactic acid milk was used as a basis for essentially the same reasons it was used elsewhere alone. The necessarily high percentage of carbohydrate in the paste feeding appeared to be better taken care of in a lactic acid medium. The paste was fed by spooning it into the infant through a large hole in a hygeia nipple.

The lactic acid paste feeding was made as follows: 1 quart of fat free lactic acid milk, 9 tablespoonsful of farina, 3 tablespoonsful of Dextrimaltose No. 1. Cook one hour in a double boiler. If well tolerated whole lactic acid milk was used. The mixture comes out very thick, thicker than rice pudding. If left cold, it forms a jelly.

CONCLUSIONS

Acid milk in various forms was used for 3 months on 70 cases with very good results.

Acid milk is useful in a hospital in straightening out gastro-intestinal disturbances quickly.

It is economical.

It is easily digested.

It is not a panacea and not a routine food for infants.

Fats seem to be better handled in an acid medium.

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THE POTENTIALLY UNDERNOURISHED CHILD

BY ARTHUR M. KIMBERLY, M.D., WORCESTER

ALTHOUGH the problem of undernutrition has received great, perhaps undue, emphasis in the medical as well as lay press, one aspect of the question has received strikingly little comment: namely that the perfectly healthy child of a year or eighteen months has been the chief contributor to the undernourished group and may in all fairness be thought of as potentially the undernourished child of the future. In order to visualize the situation, we may picture a

goodly proportion of our nutritional triumphs of the first year as falling seven, ten, or more percent under weight at three to six years of age and we are forced to ask by what errors in management their nutritional backsliding has been occasioned. It is perfectly apparent that between the age of thriving babyhood and the crisis that brings the undernourished child to office or clinic events have transpired that merit our serious attention. It is fair to assume that a correct evaluation of these events will aid in preventing future undernutrition by indicating suitable preventive measures. Perhaps the most outstanding feature of the period in which these nutritional states develop is that it is one of scant regular medical supervision and attention.

It is generally felt by mothers that in progressing beyond the bottle stage, the baby has passed a crisis. Formulas required accurate measurement and attention. A missed bottle stood in the ice-box as a reminder of something gone wrong and a matter of serious moment. It is with a feeling of distinct relief that the mother welcomes her baby as he graduates on to the family diet. Increasingly less and less attempt is made to fit this to his needs. His house diet is not thought to require the same accurate attention as his formula. His ability to weather various liberties that are taken with his diet encourages further disregard of his gastric and intestinal limitations. There inevitably comes a break in his ability to handle these unsuitable foods. By this time a serious digestive disturbance may be well under way.

The sturdy little runabout who apparently is doing so well is thought proof against the necessity of using scales and keeping a weight record. By this time he has outgrown his baby scales. It requires additional effort to take him outside to be weighed. On the whole it seems rather unnecessary. Consequently several months may have passed before the mother is warned that something has gone wrong because of his failure to gain or actual loss of weight.

Relying again on the child's apparent well being, various interruptions are permitted in the regularity of his schedule. His sphere of contacts at this period is broadening tremendously by his social intercourse with other and perhaps older children outside the home. His play life, instead of being reserved and quiet with inanimate objects, becomes naturally more active and boisterous. His nervous and physical reserve is seriously impaired by permitting inroads into his rest and sleep periods. Trips and family recreations are allowed to interfere with the rest periods. Many a serious breakdown has followed an ill-advised or poorly planned period of recreation.

The child at this period becomes more and more assertive of his likes and dislikes in regard to food. He has been encouraged by having been permitted to sample various foods at the table "Just to see what they taste like." He hears his food habits discussed openly by his parents. Consequently he becomes deeply impressed with his interesting abnormalities in this regard which makes him more and more addicted to fussiness in his eating. All too often these habits are fostered by observing similar habits in the adults at the table. He soon discovers a previously unrecognized voluntary control over his vomiting center. Meals are allowed to drag and drag and the pathways to his inhibitions become more and more definitely established.

Right here very serious disciplinary problems develop. Scolding, pleading, and force are alternately applied. It is safe to say that these methods are almost invariably unsuccessful. They serve to focus the child's attention on his dislikes and make it more and more easy for him to resist. Unfortunately an antagonism is developed between parents and child that may have a very far reaching effect on his future. The disciplinary problems acquired at this time are projected into other fields. The spirit of coöperation and mutual understanding that should exist between mother and child may become irreparably damaged. That all this friction with its very serious reaction on the home life has a very damaging effect on the child's nutrition and emotional stability may, I believe, easily be shown. The seriousness of these disciplinary conflicts is frequently in direct proportion to the emotional instability of the parents.

Faulty food habits are thus easily acquired. The mother feeling that she cannot let her child starve allows indiscriminate feeding between meals. This of course reacts unfavorably on the next meal. Occurring, as it does, frequently in the latter part of the morning or afternoon whatever semblance of an appetite the child might otherwise have is entirely destroyed. The harmful effect of candy, ice cream cones, soda and endless sweets hardly need be commented upon. The mineral containing foods, i. e. whole meal breads and cereals, fruits, vegetables, unrefined sugars and syrups; the harder foods that require exercise of masticating muscles, and salivary glands, with beneficial effect on the development of the tongue, jaws and teeth; the vitamin containing fruits, vegetables, and dairy products; the coarser vegetables and fruits that assure adequate roughage with proper stool formation; all these are absent to a greater or less extent from these little patients' diet. Nutritional anemia, frequently serious in severity, is fostered by the one-sidedness of the diet that these children are permitted. Certainly their deficiency of skeletal development is an eloquent commentary on their mineral starvation as are their spindling arms and legs on their total caloric intake.

Serious social maladjustments may develop. The child comes into contact with older children in the family or neighborhood. He may be

tyrannized over by them, or perhaps, with equal damage to his nervous system, he maintains his side of the equation by violent temper tantrums and crying. That this abnormal emotional outflow has a definite physiological effect on the nutrition of the child is, I think, too little understood. Gaskell, Cannon, Cryle and other investigators have established the following facts in regard to the control of the autonomic nervous system. In pain, fear, rage, or intense excitement the neurons of the sympathetic division of this system are stimulated. As a defense reaction occurring in primitive states and to a less degree in emotional stress dilatation of the pupils, erection of hairs (goose skin), increased tenseness and tone of muscles, quickened pulse rate and peripheral vaso-dilation with splanchnic constriction occur. Glycogen reserves are drawn on to supply fuel to meet the demands of expected conflict. Cannon and Fisk showed that after a final contest twelve of the twenty-five men of the Harvard football squad showed a glycosuria, five of these twelve being players who sat on the side line during the entire game. The parasympathetic and sympathetic systems maintain a reciprocal relationship. Stimulation of the sympathetic (as under emotion) causes depression or virtual paralysis of the parasympathetic which, through vagus distribution, exercises motor and secretory control over digestion. Under emotional strain, therefore, besides increased motor activity, quickened metabolism with increased destruction of glucose, digestion and absorption come to a standstill. These facts illustrate the fallacy of the usual methods of discipline and serve to emphasize the importance of maintaining peaceful, happy relations at home and with other children. Right here, I feel, that the whole Mental Hygiene movement, as applied to childhood claims our strongest support.

The extreme muscular effort required by the baby's early attempts to walk is seldom appreciated. He is allowed to spend entirely too much time on his feet. Suitable low chairs or benches are altogether too seldom provided for him. His frequent over-fatigue results in irritability, loss of appetite and sleeplessness. No account is taken of the added caloric intake needed to meet his tremendously increased energy output. Impairment of nutrition consequently results. The matter of over-fatigue, of course, applies to late hours, movies, juvenile parties, special classes and a host of other unnatural expressions of our modern feverish existence.

Very often, at this time, the birth of another child occurs. Less attention and care are given the little runabout. Strangers come into the house. Regularity and food habits are interfered with.

Respiratory infections, which during the first year were essentially trivial, on a poorer nutritional background, become more and more serious. Diseased tonsils and adenoids yield toxins for chronic systemic absorption. Repeated attacks of nasopharyngitis, tonsillitis, bronchitis, sinusitis, otitis media, pyelitis, etc. occur. Secondary lymph glandular involvement develops. These cut down on nutritional reserves. The exanthemata occur with increasing frequency. Following a train of illnesses static and postural defects develop, exerting a profound effect on general nutrition. Convalescent periods are seldom prolonged till normal weight is regained.

These commonplace errors in home management serve to emphasize the importance of some sort of medical supervision during these critical habit forming years of a child's life. During the past ten years there has been a rapidly growing tendency to place the baby's hygiene and care during the first year more and more under the attention of a physician. The movement of health conferences and well-baby clinics has spread tremendously from coast to coast. It has resulted in a very definite and real improvement in infant care and feeding. The time for a more universal extension of this care to the succeeding years is certainly at hand.

Public health authorities are greatly interested in the matter of a proper approach to the health problems of the pre-school period. Although several interesting experiments are being performed in relation to the health supervision of children in this group, and it is perhaps one of the most talked of public health problems, it remains perfectly safe to say that at present the family physician and pediatrician obtain the closest access to the health problems of this group. It is, moreover, not at all venturesome to assume that, as a group, we are not more than touching the health direction and educational possibilities offered by this period.

Recognizing in the perfectly healthy infant of one year the potentially undernourished child of this later period, it devolves upon us to urge the importance of continued supervision and weight recording during this period. We must teach that errors in diet and hygiene at this time may breed serious consequences, often the more so, because their onset is insidious. We must insist that children require, if anything, greater regularity of schedule with even more rigid preservation of sleep and rest periods than formerly. We must emphasize that the child is still essentially a baby and requires the same careful selection of food as he did when he was an infant.

In regard to food habits: we must discourage the promiscuous sampling of food at the table; and we must insist that children be taught to eat unquestioningly the food that is set before them, urging, if necessary, a prompt withholding of other foods until properly trained. His management must be guided by the principle that the adults must set the example of correct food habits, and must be inspired by the assurance that a child *can* be taught to eat and enjoy the foods that are good for him. We must

urge that his training may be accomplished more readily by the force of approbation, enthusiasm and encouragement than by dogmatic commands. On the other hand we should teach that if merited his punishment should follow with inevitable certainty and, as far as possible, have an educative value. We should be prepared to provide suitable diets containing adequate mineral matter, roughage, vitamins, and total calories properly balanced.

The mother should be warned how easily children become overfatigued and consequently cross and irritable. Respiratory infections must be guarded against; immunization carried out at proper times; and convalescence should be prolonged until normal weight and strength have been regained. Social adjustments should be made, so far as possible, to prevent friction and abnormal mental strain.

To be able to offer this type of service would mean for many of us a departure from the accustomed haunts of curative medicine. It would require a definite education of the public in its value. Deficiency in medical school training in this regard may be made up at the expense of several excellent texts and of publications of such institutions as the National Committee of Mental Hygiene, American Child Health Association, and State and National Bureaus of Child Hygiene. Success in carrying out such a preventive program for the preschool period will require a well formulated office outline with a definite program of the health habits that should be acquired at each age period. Painstaking inquiries into the child's habits and activities must be made and a shrewd insight into the home sitution must be obtained. We must make a tactful approach to the mother and, above all, have a common sense easily understood viewpoint and an enthusiasm that will command the mother's full effort and coöperation.

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A STUDY OF CONDITIONS FOUND IN ONE THOUSAND CASES OF TONSILLECTOMY AND ADENOTOMY*

BY LOUIS ARKIN, M.D.

MUCH has been said and written on the subject of Tonsillectomy and Adenotomy. The importance given this subject is a well earned one when we consider that the human body is submerged in a sea of organisms where together with them we are fighting a battle for supremacy. Any rupture of the normal healthy continuity of our protecting surfaces, such as the skin or mucous membranes, or any lowering of the normal resistance of any of these organs may become the primary source of invasion by these usually antagonistic surrounding organisms or bacteria, causing an unbalance of the delicate relation between health and disease in favor of the latter.

Some of our organs are more prone to these pathological changes than others; due either to location or exposure, and some, when diseased, may cause the severer ailments.

The tonsils and adenoid tissue are unfortunately both of these. Their location in the body is such that they are easily accessible to pathogenic bacteria, and when they become diseased may, and very often do, cause the severer ailments that the human body is heir to.

In a short paper such as this is, only the fundamental points or "high spots" can be mentioned, leaving out the details, however important they may be.

The following views, which have been obtained mainly from clinical observations of both hospital and private cases, are not new, but they have been corroborated, in my mind at least, and I thought that the repetition of them may be worth while. Added to these are a few statements obtained from the study of one thousand cases, picked at random, from those that we operated upon at the Forsyth Dental Infirmary for Children, in all months of the year with the exception of July and August, from the years 1917 to 1922.

When we say "adenoids and tonsils" we generally have in mind the clinical aspect of the situation represented by three masses of lymphoid tissue; two in the mouth, the palatine or faucial tonsils, one on either side located each in a triangular space, the tonsillar fossa. Each faucial tonsil lies against the superior constrictor muscle, bounded on that surface with a tough membrane called the capsule. Upon the inner surfaces of these two tonsils are about eight to twenty depressions connecting with as many crypts, most of which penetrate the tonsil to its capsule. The third mass of lymphoid tissue, or adenoid, or epipharyngeal or Luschka's tonsil is a mass of discrete patches of lymphoid tissue situated in the vault of the nasopharynx where the roof and the posterior walls meet, and it has no capsule, as the faucial tonsils.

This is the clinical aspect, although anatomically these three masses are only a part of a se-

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ries of still other exaggerated masses of lymphoid tissue situated in the upper respiratory tract, all taken together to form "Waldeyer's lymphoid ring." For instance we have some lymphoid tissue around the Eustachian tubes in the fossae of Rosemüller, some at the base of the tongue, or lingual tonsil, some at the larynx and some in the nose. But this is not all, for all these masses are united and drain into the next step of the lymphatics of the neck, and from these down, so that we are dealing with a portion of the lymphatic system itself with all the medical attributes applying to any other part of this system, with the exception that these structures show special peculiarities due to their location.

Histologically, the adenoids and tonsils are similar in structure to any of the other lymphatic glands, having a connective tissue stroma, lymphoid cells and afferent and efferent vessels. This is important because there is not found any specialized structure of the adenoids or tonsils that could give us a reason to say that the adenoids or tonsils have a specialized function. I mean that there is no *structural evidence* for a specialized function of this particular portion of the lymphoid system.

Normally, these adenoids and tonsils lie innocently in their proper locations performing their normal functions and only occupying a very small space, for the tonsils normally are only the size of almonds, and the adenoid shows itself only as a thickened layer of soft tissue in the vault of the pharynx,—but when they once show signs of abnormal activity they begin a train of symptoms that are always disturbing and very often lead to some of the profound diseases.

Firstly, considered anatomically, there may be an unbalanced relation between the size of the pharynx and mouth, and the adenoids and tonsils. The post nasal space and mouth may be smaller than the average, and the normal sized adenoids and tonsils at the least enlargement may create a partial obstruction, giving rise to symptoms to be spoken of later. Or, the reverse may be true, that the pharyngeal space and mouth may be anatomically so much larger than the average, that even a moderate enlargement of the adenoid and tonsillar tissue may not give rise to any symptoms whatever. However, in the vast majority of cases where the relation of mouth, pharynx, and adenoids and tonsils are normal, any affection of the adenoids and tonsils will produce symptoms that need proper care.

The main functions of the upper respiratory tract where the adenoids and tonsils are located are to assist in respiration, deglutition, and phonation. There are less important functions to be mentioned such as moistening and warming the air as it passes along the mucous membrane on inspiration. The pharynx also assists in hearing, on account of the connection of the middle ears with the nasopharynx by way of the Eustachian tubes. The food is moistened as it passes over the oropharynx, and the sense of taste is greatly assisted when the olfactory nerves or the air passage to them are not interfered with, as is sometimes done by pathology of the adenoid tissue.

There are several other functions that are often alluded to that the faucial tonsils may have, but they are mostly theoretical or not proven. For instance, it is mentioned that the tonsils may have a specialized function such as the thyroid, or pituitary or the suprarenal glands. There is no evidence to prove this view either from the structural or physiologic investigation, and reversely, the body economy is not interfered with when they are removed, and in most cases the removal of the tonsils for just cause, improves the individual, so that if anything the tonsils have a negative or deleterious function so to speak, in that they too often act as a menace to health on account of the frequency and ease of infection or disturbance.

It has also been mentioned that the tonsils and adenoids may produce some substances in early life that have to do with the proper development of the bones of the face and head. Since this is only a conjecture, I might mention that if this be true, the other remaining portions of the upper lymphatic chains, as well as the rest of the lymphatic system, probably have the same function, and take on the burden of supply of these substances in a compensatory manner if the tonsils and adenoids are removed early in life. It is also said that the tonsils play a part in the production of immunity; that is, that the invading organisms are arrested in the crypts and that the toxins are absorbed in sufficient quantities to produce antibodies in the host. There are other minor suggestions that need not be mentioned at this time.

The tonsils and adenoids have two functions, but only similar to any other gland of the lymphatic system, that should be mentioned. From histologic study it has been found that the efferent vessels of a lymphatic gland have more cells than the afferent vessels and it may be that that tends to prove that the glands have something to do with the formation of some of the blood cells and therefore have a haemopoietic function; and secondly, that the glands of the lymphatic system, including the adenoids and tonsils, show phagocytic powers and therefore act as a protecting screen over the body against invasion especially by bacteria. I mention these views and their arguments pro and con, because it is the disturbance of any of the above functions that give rise to symptoms that need our attention, and the proper understanding of them will indicate the proper course of treatment.

Now, it is the first "cold" or attack of coryza, of an individual that is important, for it may be *the* beginning of a long train of symptoms,

the important ones of which I am going to mention. I do not know that it is known what the one etiological factor is that causes the onset of the first cold. There is probably no one cause. We do know, however, that neglect of the personal hygiene has much to do with it. Neglect of proper food; proper ventilation in the home and school; neglect of proper clothing; neglect of proper exercise; normal physiological processes such as eruption of teeth may cause a nasopharyngitis involving the tonsils and adenoids; all enter as factors in the production of the first cold. Unfavorable climatic surroundings is an important factor in the production of nasopharyngeal infection; and, in a lesser degree, heredity may have something to do in lowering the body resistance, where the parents may be infected with tuberculosis, malaria, syphilis, etc. However, whatever all the etiological factors may be, the first thing that happens is a hypertrophy of the lymphoid tissue of the nasopharynx represented mainly by the adenoids and tonsils, attended by an increased amount of blood supply and increased amount of secretion. Mechanically, there is a lessening of the respiratory space interfering with the proper action of the respiratory apparatus. And a supervening infection by the bacteria normally lodging there may coëxist. Of course, the other classical symptoms such as fever, restlessness, nasal discharge, redness of mucous membrane, etc., are present.

These symptoms may subside after a few days with or without treatment and the individual may become practically normal again,—but, if the predisposing causes continue to exist other attacks follow, each leaving behind it a series of more or less permanent pathological conditions making it easier for a future attack. Thus a vicious circle is produced involving cause and effect.

Now, if the mild symptoms of the first attack do not soon subside, or if other attacks follow, the following is a train of symptoms that may follow:—

First *mechanically*: As I mentioned above the obstruction to respiration, which should be normally through the nose, is increased and breathing becomes shallow and after a while the lungs not getting the benefit of full deep respiration, are not well developed especially at the apices which we know is a common location for foci of tuberculosis. The bony framework of the individual being in a moldable condition, more so the younger the individual, the shoulders follow the poor development of the upper portions of the lungs and the patient becomes round shouldered. After a while, more air being needed for the body, the mouth is called upon to help, and instead of the mouth being closed during respiration, except temporarily on extreme exertion of the body, is opened to allow more air into the lungs. As a result, the mucous membrane of the mouth and oropharynx becomes dry, and the inspired air not going through the nose where the mechanism for the filtering, warming, and moistening the air is located, reaches the larynx, trachea, and lungs dry, cold, and not properly filtered. The result is that the patient has a dry throat especially in the morning, and a hacking cough. On account of the extra exertion on the part of the patient to get air much energy is used, especially at night when the body should be more at rest, and the patient is restless, sleepless, sweaty, noisy, and in the morning, instead of getting up from a sound healthful sleep, the person is irritable, exhausted, and on account of the poor oxygenation of blood becomes anaemic and then begins to lose his appetite. One step follows another till the individual is a fertile mass for any complication.

Again the continued open mouth causes the lower jaw to drop and chin recede and this continued position fails to exercise the facial muscles, losing thereby the finer expressions of the face. Further, the non-use of the facial muscles causes pressure over and on the alveolar arches, especially the upper, giving rise to the narrow upper dental arch and V-shaped roof of the mouth. Malformation of the teeth occurs. On account of the narrow arch the floor of the nose is narrow, the nasal bones do not develop properly, causing deviated septa, the nose becomes thin, the nasal accessory sinuses are poorly developed, and you there get a picture of the "adenoid facies." With it all there is a mental inferiority produced given the name of "aprosexia," and the child in school is always below par both mentally and physically.

This picture may be complicated, and often is, by this hypertrophy of the lymphoid tissue, especially that located at the Eustachian tubes in the fossae of Rosemüller, pressing against the mouths of the Eustachian tubes, and there giving rise to a train of symptoms referable to the ear, such as loss of hearing and infections of the middle ears. In fact, it is said that 90% of the middle ear troubles can be traced to disease of the nasopharynx most of which is traced to disease of the adenoid and tonsil tissue.

Again, on account of the obstruction to the respiratory spaces of the head the loss of proper resonance is set in and phonation is interfered with, especially with the consonants M and N. Also the air passage to the olfactory space in the nose is occluded more or less and the sense of smell and taste, which is a great deal smell, is partially or wholly lost. Besides these symptoms, presented from a purely mechanical standpoint, we must not forget that with the hypertrophy and hyperplasy we get an increase of secretion, which often remains in the postnasal space on account of the child not being able or trained to clear his nose. This secretion may run out from the nose over the upper lip and around the nostrils causing a dermatitis, or eczema, or the secretion may drop backward carrying with it infection to other parts of the pharynx and mouth, causing caries

of the teeth, or may be swallowed causing gastric upsets.

In addition to all this a bacterial infection may set in, and usually does, when you may get your symptoms of acute infection of the tonsils or pharynx or any other portion of the respiratory tract, often complicated by a peritonsillitis or peritonsillar abscess or retropharyngeal abscess, or abscess of the ears or the neck.

I just want to add that we must not leave out the possibility of an infection breaking through the surrounding barrier of the local healing processes and entering the general system causing general systemic diseases such as rheumatism, endocarditis, nephritis, appendicitis, thyroid disease and the possibility of infection of any of the organs, depending upon the kind, virility, number of germs, and the resistance of the particular organ.

Of course, we know that fortunately all cases of adenoid and tonsil disease do not present all of the above symptoms, but most cases present many of them, and we must apply the best methods for the cure, and, if possible, the prevention of them.

I am not going to dwell on the medical care of adenoid and tonsil disease, except to say that in some few cases mild conditions or first cases may be treated medically subsiding the disease and bringing the patient back to practically its normal condition.

The diagnosis is easily made from a consideration of the above symptoms and the usual examination of the oropharynx and postnasal space. The treatment for all cases of adenoid and tonsil disease, outside of a few mild cases, or the first attack, is surgical.

The operation is called Tonsillectomy and Adenotomy. Tonsillectomy because the entire mass of tonsillar tissue can be removed, and adenotomy because the adenoid tissue is not a definite encapsulated mass as the tonsil, but is more of a diffuse mass of lymphoid tissue, although more or less definitely located; and it, therefore, cannot be entirely extirpated on account of some small lymphoid spots, that are a part of the lymphatic chain remaining below the mucous membrane after operation, by our present means.

It is now practically agreed that as a matter of preference this operation should be performed at a hospital, and especially so if an adult, or a place prepared for this procedure at the home. It should never be attempted at the office where the patient may stay a short while and sent home. If done under favorable conditions the operation is usually devoid of complication and worry.

At the Forsyth Dental Infirmary for Children, and I believe, at most other institutions, arrangements are made to receive the children the night before, when the temperature is taken and the throat and body are examined for contagious or infectious conditions.

The child is then put to bed and suitable preparations carried out for the operation. On the next morning no food is given, a pediatrician makes a physical examination of the child, the temperature, haemoglobin, and weight are taken, and any abnormality noted, especially that may contraindicate operation at that time. Then the operator, before operating, examines the throat and his findings are noted.

The patient is then given gas-ether anaesthesia by, or under the direct supervision of, trained anaesthetists. The patient is put in a sitting posture and the operation is done under indirect electric illumination. We use the dissection method. The patient is then wheeled back to bed and put under the care of a nurse. After the operation the surgeon revisits the patients for possible assistance. The child is under the care of a nurse till the day after the operation, when again a general examination is made for any unusual condition; temperature and weight are again noted. The child goes home —returns in three days for examination of throat, and then again is asked to return in one month to note the end results after that period, when haemoglobin and weight are again taken.

I have only lightly touched on the above routine, but if studied in detail it would bring out what seems to us an ideal procedure for this operation.

I have tabulated the available notes on one thousand cases, taken at random, operated at the Forsyth all through the year with the exception of the summer months of July and August.

All the children lost weight during their stay, as would be expected, amounting to an average of 3.51 pounds each; but when they were reweighed at the end of a month they not only gained back their original loss but added on in addition an average of 3.23 pounds. I understand that the average normal gain of children of this age is about one-half pound per month.

In regard to the haemoglobin, the average amount gained after one month from the date of operation was 3.33%. This average gain seemed smaller than was anticipated, but it is probably explained by the fact that the average haemoglobin percent of the children at the start was comparatively high. It is noted though that those children who had a low percent of haemoglobin gained most, and those who started with a haemoglobin percent of eighty to ninety did not show any appreciable gain.

In regard to haemorrhage. The nurse is instructed to note carefully any condition that may be considered a so-called haemorrhage and the operator is immediately notified. In spite of this precaution and extra care, we have had in these thousand cases ten so-called "moderate" and seven "slight" haemorrhages. The "moderate" cases needed assistance such as pressure with or without medicines: and the "slight" cases were rather a matter of routine

record than of any concern. We had no fatal cases from haemorrhage.

The symptoms for which operation was advised were in general improved.

The post-operative treatment in the uncomplicated case is to leave the patient alone to allow nature to repair and heal the operative areas. Keep the patient in bed two or three days, feed him on cool, soft, non-irritating preparations that will slip by the operated field easily and treat the rest of the case symptomatically.

Now, finally a few words upon some of the debatable views regarding the operation. Firstly, there are often mentioned some objections to the operation, both by the patient and the profession. Some patients say that they do not mind the operation but fear the ether. We know that ether, the anaesthetic we use here mostly, does not have an attractive effect upon the majority of people, but when given by one of experience, and administered properly, such as perhaps preceding it by nitrous oxide gas anaesthesia, it is not so objectionable. Many cases, especially adults, may be operated upon under local anaesthesia.

Again, it may be said that the child is too young to have the tonsils and adenoids removed: Tonsillectomy and adenotomy should be done at any age when correctly indicated and when the physical condition does not contraindicate operation. The same rules as apply in general surgery apply here, although we know that tonsils and adenoids, starting prenatally, develop till the child is about eight years old and then begin to atrophy after puberty in most cases. Why misconstrue this information and wait till permanent damage is done which cannot be remedied by subsequent operation. At no time should a case be operated upon unless symptoms warrant it, but when these symptoms do occur one should not hesitate to relieve them by surgery at any time, if surgery is indicated. Why wait till the horse is gone before locking the stable door? I said that the operation can and should be done at any time, which will answer the notion that these operations are best done in May or in the spring. I believe this view to be a heritage of superstition. When the case is not an emergent one, one can choose the time most convenient for one.

Again, it is mentioned that the tonsils and adenoids will grow again, especially if performed when the patient is too young. The tonsils can not return or grow again if compltely removed. There are some cases where the lymphoid tissue normally situated at the base of the tongue near the tonsillar fossae may become hypertrophied and perhaps protrude somewhat into the lower portions of the tonsillar fossae. This can not be prevented, if it does occur, since there is much lymphoid tissue besides the tonsillar and adenoid masses. If there is infective tonsillar tissue present any time after operation, the answer is usually that all has not been completely removed at the time of the operation. The same is practically the case with the adenoid tissue, except not so definite, for the adenoid tissue is not one discrete definitely encapsulated mass, but is an exaggerated mass of lymphoid tissue surrounded by other smaller patches of lymphoid tissue which are impossible to remove entirely. These remaining smaller bits may hypertrophy later and give rise to similar symptoms as previous to operation. But this is the rare exception, and even if a secondary operation is indicated in these few cases, it occurs usually years after the first, and in the meantime the child has had all the benefits of a clean postnasal space.

It is said that the voice may be altered, especially in professional singers, by this operation. I have had several such individuals whom I have operated upon with very good results. If any alteration occurred, it was for the better, and this seems to be the consensus of opinion.

Now, with reference to haemorrhage and that it is a bloody operation. I find that except in the most unusual cases for which there is usually a definite cause such as an abnormally large, or abnormally placed artery, due to abnormal anatomy, or much fibroses following frequent or many attacks of tonsillitis, or new growths, the loss of blood is never enough to cause alarm, if the operation is done properly. Reversely, there is too much stress laid upon the statement of a so-called "bloodless" tonsillectomy and adenotomy. There are some pendulous tonsils that can be extirpated with but a few drops of blood, and with special care and extra time there are many other cases that will show but a little oozing, but with the vast majority of cases there is some bleeding although not enough to be of any concern. Of course, in the removal of the adenoids there is always a certain amount of venous bleeding that subsides in a few minutes.

The blame that was at first thrust against tonsillectomy and adenotomy as a main factor for post-operative lung abscesses is now being minimized, and it has again been brought out statistically in Dr. Linenthal's paper at our last meeting, that lung abscesses are not necessarily caused by this operation, any more than by any other one operation, but that there seems to be some general causes yet unrecorded.

Now, as to the method of operation. There are many and varied methods, all aimed at the same result. We use the dissection method for reasons that seem to us an advantage over the other methods, many of which we have tried. The gist of this point is that it makes no difference what generally accepted method you use. It is the man behind the gun that counts and not so much the particular method. We must also remember that no surgeon should undertake the operation lightly. He should be well equipped with all the necessary appliances

as well as a knowledge of this work, for tonsillectomy is not yet a perfected operation, nor an absolutely safe one. Speed is essential but never sacrifice good results for speed.

Of late we have heard much about the use of radium and the X-rays for the treatment of chronically inflamed tonsils. We do know that radium and its emanations, and the X-rays will shrink lymphoid tissue, but it does not appear that the shrunken tonsil can do away with infection and eliminate the possibility of acute tonsillitis. This mode of treatment may be used to advantage in cases where the enlarged tonsils are only obstructive physically, or where operation is absolutely contraindicated, or in those cases where post-operatively the pharynx still persists in giving rise to menacing symptoms. Until we know more about the advantges and limitations for the use of radium and X-rays, we are safer to depend upon Tonsillectomy and Adenotomy.

I have tried to review this subject, perhaps in a haphazard way; I have perhaps overemphasized some points and not given enough importance to other phases of the subject. I hope, however, that I have called to your attention some conditions that may be of some importance and assistance.

IMPROVED METHOD OF INHALATION TREATMENT FOR INFANTS

BY B. T. STRONGMAN, M.D.

The results of inhalations as given to infants and young children are often disappointing. Yet conditions in which successful inhalation would be of great benefit are very frequently met in pediatric practice—namely, croup (either spasmodic or bronchial), common nasopharyngitis, certain types of pneumonias, pertussis, etc. Any method which spares the administration of drugs by mouth is valuable. It seemed to me that the inability of these youthful patients to raise their bronchial secretions was the real drawback in the usual steam tent method. I now instruct the mother or nurse to lay the baby across her knees on its abdomen with the head hanging down and to place the steam kettle on the floor—thus combining postural drainage with the inhalation. Fifteen to twenty minutes in this attitude seems to accomplish better results than a longer seance in a tent. It is simpler to adjust; there is no over-heating of the patient; no flame is required to keep the kettle heated for the shorter period; the mother or nurse can keep one hand near the patient's face and guard against any chance of a burn.

MEETING OF THE NEW ENGLAND PEDIATRIC SOCIETY, JANUARY 9, 1925

(Dr. Richard M. Smith in the Chair)

CRANIAL RICKETS

BY HENRY E. UTTER, M.D., PROVIDENCE

For a number of years the cranial bones have been considered by many observers to show the first signs of rickets. Barlow[1] in 1889 placed craniotabes among the earlier signs. Moore[2] states that craniotabes and lateral flattening of the skull are early important diagnostic signs.

Unfortunately the advent of metabolism studies has relegated some clinical manifestations to the background of importance. DeBuys[3] maintains that the only rational diagnostic symptom of rickets is an upset in product of blood phosphorus and calcium, and places the rachitic rosary and epiphyseal enlargement as the most valuable diagnostic signs. Dr. Howland in discussing this aspect states emphatically that he does not consider it necessary to show a negative balance of the calcium and phosphorus ratio to prove the presence of rickets.

Is it not possible that craniotabes or lateral flattening of the skull may develop before there is an actual change in the calcium phosphorus product? Clinical manifestations in the skull are nearly always followed by signs in the ribs and epiphyses, but how often do we find that craniotabes appears after epiphyseal enlargement and the rachitic rosary under careful observation. Barenberg and Bloomberg[4] in a recent article state that under four months of age craniotabes is not a result of rickets, but that after four months craniotabes is intimately associated with rickets and therefore after four months should be considered as a diagnostic sign of value. Their observations are based on the fact that epiphyseal rickets does not appear according to the roentgen ray until after four months and they found in their series only one case with a low blood phosphorus under four months. That the epiphyses reveal nothing before four months of age, in the presence of craniotabes, would indicate to the observers who state that the upset in the phosphorus calcium product is a manifestation of healing rickets, that craniotabes is quite definitely the first and earliest clinical sign of rickets. Certainly no known disease except rickets is accompanied by craniotabes, and if the roentgen ray shows no change in the epiphyses before four months of

age, we have additional evidence that craniotabes is an earlier sign than those to be found in the ribs and epiphyses.

Rickets may be arbitrarily divided into three periods from clinical, roentgenological and chemical observations—each period may overlap the next succeeding one. First—the period of clinical manifestations in the skull, with later roentgenological evidence in epiphyses and chemical manifestations, extending from the second to the seventh months. Second—the stage of healing rickets, as shown in the ribs and epiphyses from the fourth to twelfth months. Third—the stage of deformities, appearing from the ninth month upward to two or three years.

This report will be limited to certain cranial changes as found in 192 cases observed in white children mostly in private practice with a few additional cases from hospital clinics. Most of the infants were living in excellent or moderately comfortable circumstances. Of the available literature, observations have so often been made on colored children, e. g. Levinson[5] reports 400 cases of craniotabes, 396 of whom were in colored children. Discrepancies in observations relative to the value of clinical signs of rickets may be due to the fact that so many colored children have been used as a basis of the reports. They come to the physician late, when early signs in the skull have disappeared and the manifestations in the ribs and epiphyses dominate the picture.

Let us take up the subject of cranial manifestations as evidenced by craniotabes, softening along suture lines, lateral flattening of the cranium, the so-called "oblique head," a sign which has been designated as cranial resonance, and evidence relative to the size of the fontanelle.

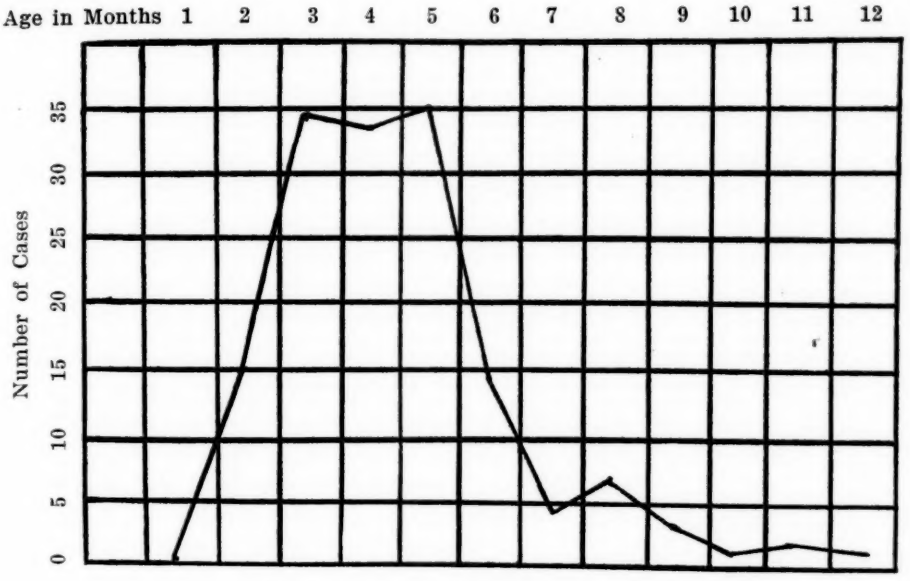

CHART TO SHOW AGE INCIDENCE OF CASES

CRANIOTABES

Craniotabes is considered to be present when under firm pressure there is abnormal flexibility of parietal or occipital bones at points distant from the suture lines.

Craniotabes was by far the most common head sign encountered. In the total 192 cases with signs relative to the skull, 155 had craniotabes. Seventy-two showed varying degrees of craniotabes involving both sides of the cranium, the posterior part of the parietal bones being the most commonly affected site. This was the most common site of craniotabes in the cases reported by Levinson. When both sides were affected, usually the right side was most extensively involved.

Of the cases showing craniotabes of only one side, the right evidenced the sign in 71, whereas there were only 12 cases in which the left side alone was affected. This selection of the right side is difficult to explain. The degree of craniotabes and the age at which it appeared varied somewhat with the general physical condition of the infant. For instance, the premature baby showed a greater degree of craniotabes at an earlier age than the full term, more robust infant.

A study of the seasonal incidence of craniotabes showed what might be expected, namely, the greater number of cases (22) appeared in March, with January (17), November (16), April (16), February (15), following in order. If rickets follows the months of least sunshine and closer housing of infants, the fact that more cases appear in the spring gives us additional evidence of the length of time necessary to produce rickets. The process probably begins in the majority of cases in November and December but manifests itself in the early spring months.

In regard to the age at which craniotabes most often appeared, the period between the second and fifth months of life showed the greater number regardless of the season of year observed. In the second month there were 16 cases, in the third month 34, in the fourth month 33, and in the fifth month 35. The remaining cases appeared in later months of the first year.

In order to determine whether craniotabes appeared in the newborn, 100 infants were studied with negative results in all, including five premature babies.

None of the infants with craniotabes presented parietal bosses, except a few when observed later, after the softening had disappeared. Bosses are apparently a part of the second or healing stage of rickets.

As a matter of interest, 74 of the 155 presenting craniotabes were tested with the galvanic electric current. It was thought that a certain number might show latent tetany. In the cases tested a CCC of 1 M. A. or less and a reversal of ACC and AOC was considered a suggestive reaction. Such reactions were obtained in 33 of the 74 tested. It was interesting to note that of the 33 suggestive reactions, 28 were obtained in January, February, March and April, the tetany season. Of the negative reactions—41 in number—24 were obtained in January, February, March and April, as against the 28 of the suggestive 33. If we assume that tetany is a manifestation of rickets, suggestive electrical reactions in young infants with craniotabes may give further testimony of the value of craniotabes as a sign of early rickets.

OPEN SUTURES AND SOFTNESS ALONG SUTURES

An undue amount of flexibility of bones along the sagittal and lambdoid suture lines, when appearing after the second month of life, except in the premature infant, probably has the same significance as craniotabes. Occasionally this abnormal flexibility and craniotabes coëxist.

In the 192 cases there were 13 between the second and twelfth months, presenting softness along the suture lines or open sutures, without craniotabes. On the other hand there were 18 cases with craniotabes.

There were a total of 31 cases presenting this manifestation of cranial softening.

LATERAL AND POSTERO-LATERAL FLATTENING OF THE SKULL

In considering the cranial manifestations of rickets, the so-called "oblique head" seems of much importance. This lateral flattening of the skull appeared as early as the second month in a few babies and as is known may persist into the second and third years of life.

In the series under study there were 28 cases with craniotabes and 24 cases without craniotabes. In the latter group without craniotabes, other confirmatory signs of the presence of rickets were found in the rachitic rosary and flexibility of bones along the suture lines. Moore[2] mentions lateral flattening of the skull as diagnostic of rickets.

CRANIAL RESONANCE

During the past four years in the routine practice of attempting to elicit the upper facial sign of tetany; the Weiss sign, light percussion over the zygoma produced in some infants a resonant sound, varying in its pitch and intensity. This led to the use of percussion over the parietal bones, where it was noted that much clearer and better defined sounds were elicited. An attempt was then made to determine whether or not this resonance had any connection with other changes in the cranial bones. The degree of resonance varies slightly over various parts of the skull and the same area must be employed in different children.

In the individual case records the intensity of the sound was noted by the signs 1 —2 or 3+. In the newborn infant and in the first three months of life there was found a resonant note which was designated as 1+. Gradually this resonant note is replaced by one of flatness as the normal infant advances in age. When craniotabes, soft or open sutures or lateral flattening of the head existed, the resonant note attained a much higher pitch, the tone varying in its intensity in proportion to the amount of cranial softening present. Whether or not this note is dependent upon the thickness of the flat bones of the skull is hard to determine, but this seems the most plausible basis for its presence.

When cod liver oil or cod liver oil with phosphorus was administered the disappearance of the resonant sound was quite definitely pronounced. With cod liver oil alone the resonance changes slowly, but when phosphorus is united with the oil there is a rapid lowering of the pitch in the note. Furthermore the rate of disappearance of the note was directly dependent upon the amount of the oil given to the baby.

Again it was noted that should tetany supervene in the rachitic infant this resonance became greatly increased, at times approaching that of a hollow sound. In studying our case records of tetany, a 3+ sign was quite regularly found in the presence of active tetany. To determine whether or not this sign was akin to Macewen's sign of fluid in the cerebral ventricles, lumbar puncture was carried out in a certain number of tetany cases. Relief of the pressure helped to control the symptoms of tetany, but the sound did not disappear. If, however, large doses of cod liver oil and phosphorus were given the infant with tetany, 4 to 6 drams a day (one drop of oil of phosphorus combined with 1 dram of cod liver oil), the cranial resonance disappeared almost entirely in from 3 to 5 days. Under a

smaller quantity of the oil, the change of resonance was less marked.

Like other signs of cranial rickets this sign was not always present. In the series of cases reported, 76 were tested; the sign was positive in 62 and negative in 14. Of the 62 positive cases, the sign was noted in the most pronounced cases of craniotabes and particularly in those cases observed in December, January, February and March, the period of greatest rachitic activity. On the other hand, of the 14 negative cases, it was found that the general health of these 14 cases was better than that of many of the positive cases; e. g., the weights of these infants averaged 14 lbs. 9 oz. Further it was noted of the negative cases that only one case was observed in March, 3 in April, and the other 10 in June, July, August and October, the latter being the months of lessened rachitic activity.

The description of such a sign might seem fanciful indeed because of the personal equation involved, but what of the varying tones of resonance upon percussion over the thoracic organs, between a small localized area of pneumonic consolidation and the flatness obtained in the pressure of fluid in the chest cavity? Surely here is involved the personal equation in a method of diagnosis accepted by clinicians for many years.

As with thoracic percussion, cranial percussion becomes of value as a diagnostic implement, only after one becomes accustomed to the various notes obtained over the parietal bones, under different degrees of cranial softening.

THE ANTERIOR FONTANELLE

The large, persistently open fontanelle has often been considered as a sign of rickets. From a study of the 192 cases in this report, no definite information could be obtained, although the fontanelle was regularly measured in the oblique diameter, which seems the most feasible method of estimating the size of this opening. The antero-posterior dimension is often interfered with by an open sagittal suture.

As a general observation it was noticed that a large fontanelle was often present with marked craniotabes or lateral flattening of the skull. This however was by no means regularly true and many discrepancies were found; e. g., of two infants of nearly the same age, varying only a few ounces in weight, examined on the same day, and both presenting marked craniotabes over both parietal bones, in one the fontanelle measured 3 cm. while in the other only 1 cm. Again of two 5 months old infants, one with marked craniotabes had a fontanelle which measured 2.5 cm. while the other with only slight craniotabes had a fontanelle which measured 3.5 cm.

Such discrepancies led to the question of what might be considered a normal fontanelle from the point of size. Accordingly the fontanelles of fifty new born babies were measured, with the following result: of 6 infants, weighing from 4 to 6 pounds, the fontanelle varied from 1 to 3 cm. in the oblique diameter; of 10 infants, weights 6 to 7 pounds, fontanelle 1 to 2 cm; of 21 infants, weights 7 to 8 pounds, fontanelle 1 to 3 cm.; of 13 infants, 8 to 9 pounds, fontanelle 1.5 to 3 cm.

Thus it may be seen how extremely variable is the size of the fontanelle in new born babies of nearly the same weight. If one knew the size of the fontanelle at birth, in the individual infant, the measurement taken when other signs of cranial softening appeared might be of some value, but as this is often impossible, the size of the fontanelle gives us very little assistance in diagnosing the presence of rickets.

Nevertheless a fontanelle with a large oblique diameter, in the presence of undue flexibility of the bones forming the rim of the fontanelle, may be used as additional confirmatory evidence of cranial rickets. Of the associated signs of rickets, beading existed in 25 percent of the 192 cases under discussion. This differs widely from the observations of DeBuys[6] who found beading present in 97% of white and 98.9% of colored children, in the series reported.

Distinct epiphyseal enlargement was noted in only a few cases, usually those presenting head signs in the latter months of the first year. This report does not include roentgenologic evidence of rickets.

CONCLUSIONS

One hundred ninety-two cases presenting evidence of cranial rickets were studied. Craniotabes appeared in 155, lateral flattening of the skull without craniotabes in 24 and softness of bones along suture lines with open sutures in 13. Associated with craniotabes there were 28 cases presenting lateral flattening of the skull and 18 with open sutures or softness of the bones along the suture lines.

Craniotabes must be considered as the most reliable evidence of cranial softening. Lateral flattening of the skull is probably the second most important sign. Cranial resonance, after considerable experience in the use of this sign, may be considered as a valuable aid in the estimation of extent of cranial softening. This sign is particularly pronounced in cases of active or latent tetany.

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SOME CLINICAL ASPECTS OF THE STUDY OF FIFTY CASES OF TETANY

ROBERT M. LORD, M.D., PROVIDENCE

I SHALL give a clinical report on 50 cases of tetany in infants from the age of 6 months to 18 months, which have been taken from the records at our office; and draw some clinical conclusions.

I desire to thank both Dr. Utter and Dr. Buffum for their kindness in allowing me to use their case histories, since the majority of cases are theirs.

I shall not go into a detailed textbook description of tetany, but merely say that I have taken for my standard in picking the cases, the description given by Dr. Griffith of Philadelphia and Dr. Dunn of Boston in their respective textbooks.

The cases are drawn from private and hospital practice and some are necessarily not as complete as could be desired.

I have looked over the current literature for the past ten years and find very few clinical papers on the subject of tetany. I therefore attempt to add my small bit although I shall present nothing particularly new or startling.

Taking up in order the classical symptoms and signs of tetany, our cases present the following clinical picture.

In the 50 cases, laryngospasm was noted in 64%; carpopedal spasm in 34%; convulsions in 52%; and Chvostek and the Weiss phenomenon in 80%. (We have come to consider the Weiss phenomenon—namely the contracture of the orbicularis palpebrarum as of more importance than the originally described Chvostek, consisting in the contracture of the orbicularis oris.) Hyperesthesia was demonstrated in practically every case.

There is also one symptom which was frequently recorded in our cases and I do not find mentioned either in the textbook picture of the disease or in the current literature, which we consider as of importance in tetany, namely, oedema under the eyes. I do not mean the swelling appearing in cases of nutritional oedema, and tetany without signs of rickets.

I have purposely left out Trousseau's sign in my classification, by which I mean the constriction of the arm above the elbow with resultant production of spasm in the muscles below the area constricted. I find this sign noted in only 18% of the cases and I know that it was not looked for in many instances.

May I digress and bring out a point which we feel very strongly.

We believe that Trousseau's sign should be discarded as a diagnostic procedure, especially in private practice, because of three reasons. First, it causes unnecessary suffering to the patient due to the length of time over which constriction must be maintained on the nerves and blood vessels of the arm to elicit the sign, during which time the infant is in a highly irritable state and crying constantly; in the second place the attempt to elicit this sign may easily precipitate generalized convulsions or severe laryngospasm terminating in death; thirdly, in private practice it is a procedure which is not only dangerous but may be instrumental in losing the confidence of the patient's family.

We believe that there are many other signs as accurate and useful and therefore Trousseau's sign should not be included in our diagnostic armamentarium.

Incidentally we have seen two sudden deaths during laryngospasm.

Coming to the more scientific procedures for the diagnosis of tetany, I wish to give you the results we have obtained with the galvanic current as index of the electrical hyperexcitability in our patients. I have struck an average on some 40 cases in which this was tested.

The cathodal closing contracture, the anodal opening contracture, and the anodal closing contracture were the electrical reactions which we attempted to elicit in all these cases. The cathodal opening contracture was elicited in the earlier cases, but for exactly the same reasons as applied to Trousseau's sign was discarded after a short time. We believe, to repeat, that in attempting to elicit the cathodal opening contracture on any infant with tetany; first, you cause unnecessary pain; second, you may stimulate the hyperexcitable infant so that generalized convulsions or severe laryngospasm and death ensue; third, you lose the confidence of the family.

It must be remembered that in tetany one obtains an extremely low response to the cathodal closing current as well as to the anodal opening and anodal closing currents and the attempt to obtain a cathodal opening contracture is often accompanied by tetanic contracture of the muscles tested. We, therefore, believe that it is unnecessary to obtain a cathodal opening contracture of less than 5 milliamperes (which was the original Erb's electrical manifestation) to make a diagnosis of tetany. We believe that we have successfully proved this by cases which have had clinical signs of the most severe character with a cathodal opening contracture of greater than 5 milliamperes. I refer to cases of tetany with the entire clinical syndrome of carpopedal spasm, convulsions, laryngospasm, and Chvostek. In all these the cathodal opening contracture was elicited with a current greater than 5 milliamperes and in these cases most unsatisfactory electrical reactions were obtained owing to tetany of muscles. Also these same cases showed immediate benefit from cod liver oil and phosphorus and calcium chloride.

The average electrical reactions in our cases were as follows:—

C.C.C.	A.O.C.	A.C.C.
0.87	1.41	2.46

These results correspond fairly accurately with the work done by Thiemach & Mann[1] which are:

	C.C.C.	A.O.C.	A.C.C.
Latent Tetany	0.70	0.95	1.45
Active Tetany	0.63	0.55	1.14

Our results stand in marked contrast to the values given for normal infants by the same authors and by Von Pirquet[2].

C.C.C.	A.O.C.	A.C.C.
3.	>5	>5

Holmes[3] in his very excellent article on the Reliability of the Electrical Diagnosis of Tetany goes very extensively into the whole subject in normal children and those with tetany or with rickets and obtains in his tetany cases essentially the same results as we have in our 40 cases. In our whole series, however, there were definite symptoms or signs of tetany and none with so-called latent tetany.

This leads me to an interesting fact. In a few cases (about 15 in all) in which through frequent office visits or house calls we were able to follow the symptoms and signs from day to day; we noticed that the signs and symptoms disappeared and reäppeared. On one day there would be a very definite Chvostek which would be much less active or entirely gone on the following day. So likewise, with laryngospasm, carpopedal spasm, or convulsions. This was particularly noticeable in children who were having convulsions during this period. The Chvostek and the Weiss phenomenon would entirely disappear, due possibly to the relaxation of the whole musculature following the convulsion; and to the fact that the physician does not see the child until the convulsion itself is over, at which time these signs and symptoms are not present; and lastly that relatively few physicians use the galvanic current as a routine in private practice.

We think, therefore, that because there is extreme variability in the manifestations of tetany, many cases of active tetany are overlooked. We also believe that there are many infants who have convulsions, especially before the age of one year, on whom the diagnosis of "teething," acute gastro-enteritis, "worms," acidosis, and thymic hypertrophy is made, when in reality it is active tetany.

We feel that any such infant under one year of age in lieu of symptoms referable to the respiratory tract, gastro-intestinal tract, or acute disease of the nervous system, should have the benefit of the tests with the galvanic current and treatment with cod liver oil and phosphorus, calcium chloride, and the ultra-violet ray if accessible, as a possible case of active tetany. We are sure that a certain number of infantile deaths will be averted by this procedure.

May I now give the results we obtained relative to the months of the year in which we found cases of this disease.

January	5 cases	July	2 cases
February	5 cases	August	0 cases
March	17 cases	September	2 cases
April	11 cases	October	0 cases
May	3 cases	November	3 cases
June	2 cases	December	0 cases

We therefore corroborate previous statements that in the early spring the disease is most prevalent. Taking March and April together, 28 of the 50 cases occurred in those two months, or 56%.

As to the treatment, some of the cases occurring early in practice were given calcium bromide. All those occurring in recent years were given either cod liver oil and phosphorus or cod liver oil and phosphorus with calcium chloride. I attempted to distinguish between them, in so far as I could, as to the rapidity with which the symptoms and signs disappeared and definitely found that the calcium bromide treatment did not give as rapid or as complete a recovery as the other two. I could not distinguish any marked difference between the treatment with cod liver oil and phosphorus alone and that of cod liver oil and phosphorus combined with calcium chloride. It must be noted here that the dose given was 1 dram of cod liver oil with 1 minim of oil of phosphorus and 10 grains of calcium chloride as often as every 4-6 hours. Incidentally we have noted no ill effects from the large doses of the drug except for one case which developed slight jaundice. The jaundice cleared up rapidly by diminishing the frequency of the dose. Possibly in this case the jaundice was due to the oil of phosphorus.

I also estimated the average improvement in the electrical hyperexcitability under treatment. In doing this the difference between the first examination and the last examination noted on the records was taken.

Patients reëxamined within 1 week of starting treatment—10 cases.

C.C.C.	A.O.C.	A.C.C.
0.30	1.50	1.7
M.A.	M.A.	M.A.
improvement	improvement	improvement

Patients reëxamined within 1 month of starting treatment—15 cases.

C.C.C.	A.O.C.	A.C.C.
1.07	2.52	1.26
M.A.	M.A.	M.A.
improvement	improvement	improvement

Patients reëxamined within 2 months of starting treatment—3 cases.

C.C.C.	A.O.C.	A.C.C.
0.70	3.0	2.0
M.A.	M.A.	M.A.
improvement	improvement	improvement

Although the last series consists of only 3 cases and there is a definite discrepancy in the improvement in the response to the cathodal closing current compared with those reëxamined

within one week and one month, nevertheless there is a slow but constant improvement in all the cases.

These results seem to correspond with a statement made by Holmes and also by Weitzel[4], who say that the electrical reactions are the last to show improvement and also Holmes states that "Anodal hyperexcitability preceded cathodal hyperexcitability, accompanied it, and sometimes persisted after it." We cannot, however, agree with Weitzel that A.O.C. is soon above 5 milliamperes. None of our cases, even those reëxamined at the end of two months, had gone above an A.O.C. of 5 milliamperes.

I also thought it would be interesting to bring up again in this paper reference to the association of tetany and rickets and give you at least the clinical picture which these 50 cases presented.

70% of our cases showed craniotabes.

8% showed open sutures.

4% showed softening along the edge of the sutures.

And lastly 16% showed cranial resonance, the sign which Dr. Utter has just described to you as one of the earliest manifestations of rickets, although this sign was attempted only in the more recent cases.

We have had no opportunity as yet to perform any such exhaustive studies as Calvin and Borovsky[5] who attempted to produce tetany in tetanic, rachitic and normal children by the administration of alkali phosphates, nor those of Mills[6] who states and attempts to prove that there are two forms of rickets, one of low phosphorus and one of low calcium and says "It is true, of course, that tetany occurs independent of rickets, but it (tetany) is at all times a low calcium condition whether it be present as a symptom of or entirely independent of rickets."

I wish to present to you only the close clinical association of rickets and tetany as seen in private practice.

Therefore from the evidence of these 50 cases some clinical conclusions may be stated.

1. We have confirmed previous observations as to the incidence of the disease as being greatest in the early spring.

2. The frequency of clinical signs is shown in the followng order. Chvostek and Weiss phenomenon, laryngospasm, convulsions and carpopedal spasm.

3. We believe in discarding Trousseau's sign and in not attempting to elicit the cathodal opening contracture.

4. We confirm previous results with the galvanic current in that C.C.C. A.O.C. A.C.C. are all very low, being elicited with less than 5 M.A. of current and that A.O.C. is <A.C.C.

5. We believe many cases of tetany are overlooked because of the variability of signs and symptoms and the fact that pediatricians do not make a practice of using the galvanic current, more exclusively in their private practice.

6. We believe that the best treatment is cod liver oil and phosphorus with calcium chloride in large doses frequently.

7. And lastly we confirm again the close clinical association of rickets and tetany.

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Dr. R. M. Smith: I want to ask Dr. Utter if there was any relation between the softening of the bones and a possible syphilitic infection, and if these children were investigated from that angle.

Dr. John Lovett Morse: I do not feel competent to discuss Dr. Utter's paper, because it is very evident that Dr. Utter and I do not mean the same thing by the term craniotabes. I have always considered that craniotabes was a rather late symptom of rickets and that craniotabes of a degree great enough to be recognized was not common. I am quite willing to say that perhaps I am wrong in this matter. I have always supposed that softening of the bones in young babies was due to something other than rickets.

Dr. F. B. Talbot: I was much interested in Dr. Utter's painstaking study of this subject and was particularly impressed with the measurement of rickets with the resonance sign. A thing that impressed me was the fact that Dr. Utter, like the rest of us when we begin to study any problem, had to go back to determine what the normal was. I wish Dr. Utter had given us the measurements of older normal children in addition to the measurements of the newborn. I think if this were done, it would be very helpful.

Dr. W. R. Sisson: This paper is of interest to me as it is a study of cranial rickets as seen in private practice. It is something, I think, that has never been recorded in the literature and is, therefore, a distinct contribution. For some time we have all noted the appearance of craniotabes in cases in private practice. At one time when I discussed the question with Dr. Morse, stating that it seemed to me a very common occurrence to find rickets in children in private practice, Dr. Morse said it was because I did not take care of my children properly. He meant, of course, that there was something peculiar about the children I took care of.

Two years ago when Dr. Bloch from Copenhagen was here, I showed him a few premature infants at the hospital who had rickets.

He laughed at me and intimated that they did not show rickets. His contention was that the presence of craniotabes in premature babies did not mean rickets. I have never been certain myself whether or not one is dealing with rickets or whether it was something else, such as a possible osteoporosis.

I have seen recently a baby, aged twenty days, at the Infants' Hospital who showed very marked softening of the cranial bones, typical of craniotabes, which I think must be explained on the basis of a defect in the ossification of the cranial bones. I feel quite sure that the presence of softening of the cranial bones in very young children does not always indicate rickets. This has been established by other men. We must recognize in addition to the presence of craniotabes, the fact that very frequently, especially in premature infants, there may be congenital defects of the centers of ossification. It is difficult many times to distinguish this from real craniotabes.

MEDICAL PROGRESS

PROGRESS IN GYNAECOLOGY

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In writing this review those subjects which have shown something new and those in which there is still a diversity of opinion have been considered. Only a few articles on each subject have been cited because to cover all would be very nearly hopeless and utterly useless.

It may be of interest to know that with the aid of the abstracts published by the American Institute of Medicine we have looked over 458 articles and abstracts. These have all appeared in the last two years on gynaecological subjects and it would be conservative to say that this number is only 1/3 of the total number published. This gives some idea of the amount of repetition there is in medical literature.

For the treatment of pruritis vulvae Wiener[1] and Moorer[2] advise the subcutaneous injection of procaine alone or in combination with quinine and urea hydrochlorid. The pressure caused on the nerve endings is believed to stop the itching. Wiener believes that there is a vicious cycle in that the itching leads to scratching with excoriation which itself causes itching and that the relief obtained by the injection from the itching allows the surface to heal. The injection is made around the periphery of the affected area and may have to be repeated at intervals of one week for two or three weeks.

We believe it is wise to emphasize the fact that a fundamental cause of the pruritis should be searched for before applying this treatment. Diabetes and vaginal discharge are common causes of pruritis.

The difficulty in curing endocervicitis is shown by the number of different methods advised for its treatment. The reason for the difficulty can be understood only when one knows the histology of the cervical canal. It is lined with racemose glands. The racemose part of these glands lies in a firm stroma of connective tissue and muscle which cannot be scraped off easily. The ducts are microscopic so that drugs will not enter them. When the glands are infected the bacteria lie in the tissue surrounding the glands and, microscopically, an inflammatory infiltration of leucocytes is found all around them. This leads to exudation in the glands with excretion into the cervical canal. If it be compared with the endometrium of the body of the uterus the difficulty is clear. The endometrium consists of tubular glands which lie in a soft connective tissue stroma, the whole lying on the muscle and penetrating into it in exceptional cases only. Therefore the endometrium may be curetted off removing all of the glands down to the muscle if carefully done. Since the glands of the cervix cannot be removed easily by curetting, and since drugs will not penetrate them to cure the infection, more drastic methods must be used to destroy these glands. The methods in general are by chemical caustics, by the actual cautery, application of radium and as a final resort various plastic operations and amputation of the cervix.

The application of a pencil of potassium hydroxide in the cervical canal is reported on by Strobell[3], Couvelaire[4], and Mouchotte[5]. The treatment requires dilatation of the cervix, so that an anaesthetic is necessary. The drug is applied for a few seconds only and the treatment may have to be repeated in two weeks. All three report good results. Mouchotte[5] says that he has not seen dystocia in labor following this treatment. Couvelaire[4] has used it in 97 cases and warns against it in cases that have salpingitis as two of his had such severe reactions that they required hysterectomy. He has seen difficulty in dilatation of the cervix in subsequent pregnancies. Bizard and Rabut[6] use carbon dioxide snow applied by a special sound to the cervical canal for accomplishing the same purpose by freezing, and report good results.

The actual cautery as advised by Hunner has been in use for some years. This consists of radial cauterization of the canal with a sharp edged cautery with the object of destroying many of the glands and so decreasing the discharge. A variation of this is the use of metal bulbs heated over a flame like a soldering iron, devised by Collins[7], who reports satisfactory results.

Curtis[8] originated the use of small doses of radium to cause fibrosis and contraction of the cervical glands. The fibrosis is not enough to cause dystocia and the treatment is reported as successful. Polak[9] also advocates the same method where there is a chronic infection extending deeply.

The present treatment then of endocervicitis may be by any of these methods which attempt to save the cervix, depending on the experience of the physician. It is fair to say that there are a good many disappointing results and it is fortunate that we have plastic surgery to resort to.

In this connection it should be pointed out that it is still not generally realized that discharge from the uterus comes in the great majority of cases from the cervical canal itself and not from the endometrium lining the uterine cavity above the internal os or from the tubes. Curtis[8] has again pointed that out very definitely. Therefore it is rarely useful to do a dilatation and curettage alone to cure leucorrhoea. This procedure is for diagnosis and not for treatment except in cases with polyps and retained products of conception.

Attempts are being made to prove that endocervicitis is a focus of infection for arthritis. Moench[10] has studied 12 cases from this view by making cultures from cervical discharge and injecting animals. She concludes that the streptococcus is the important germ in this consideration; that the other organisms do not play as strong a role; and that the cervical streptococci do show an affinity for joint tissues. Dickinson[11] cites a case in which curettage of the cervical canal caused an exacerbation of earache and urticaria which was severe for 24 hours. She was free from these symptoms for 12 days when they recurred. He curetted her again with the same result but she was free of symptoms for 6 months when another curettage cured her. This is a comparatively unexplored field in which results have been disappointing so far. An endocervicitis with a marked mucopurulent discharge would seem to be an ideal focus because there are bacteria deep in the tissue close to the lymphatics and blood vessels. There have been only a few reports of small series of cases treated from the point of view of relieving arthritis and, on the whole, the results are not beneficial.

The principle foci of chronic gonorrhoea in women are the entrances to the ducts of the glands in the cervical canal and it has been known for some time that comparatively low heat kills gonococci. Many methods such as hot douches, hot baths, and various electric heating instruments have been tried to apply heat. Corbus and O'Connor[12] have devised an electrode which may be inserted into the cervical canal to apply a temperature of 116-117 degrees Fahrenheit for 30-40 minutes at each treatment. The treatments are given every 7 to 10 days. They report good results in quick and permanent cure. This method is of course contraindicated during the early acute stage and if there is tubal inflammation because it is known that instrumentation of any kind is dangerous at those times.

The treatment of vulvo-vaginitis in children has been modified by Norris and Mikelberg[13] in that they flood the vagina twice a day with Dakin's solution. This can be done by the mother. It is important to have the pelvis raised and to allow air to balloon the vagina by inserting a Kelly cystoscope. Results in 100 cases, all proved gonorrhoeal by smear, gave an average duration of treatment of 12 weeks as compared to 16 weeks by former methods.

Barringer and Bose[14] have studied the complement fixation test in 256 cases of gonorrhoea in females. Their conclusion is that it is of value in the diagnosis of chronic and sub-acute cases for they do not believe that a non-gonorrheic will give a positive test. They noted the subsidence of this test along with the clinical symptoms during treatment.

Rotter[15] believes that it is possible for spermatozoa to carry gonococci up into the uterus and tubes and that this may be a method by which the tubes become infected. The spermatozoon measure 50 microns in size, while gonococci average 1 micron, so it would appear to be mechanically feasible. He says that he has seen gonococci inside of spermatozoa.

A method of treating dysmenorrhoea has been devised which is not in general use. The theory is that although we do not know the real cause of essential dysmenorrhoea many cases are helped or relieved by dilatation of the cervix. In doing this dilatation a bar or feeling of obstruction is often felt at the internal os with the Hegar dilator as though the tissues were cicatricial. Cleland[16] decided to incise the internal os with a blunt bistoury to prevent recontraction. He makes two lateral incisions about 1/16 to 1/12 inch deep just at the internal os and then packs the uterus and cervix with iodoform gauze to maintain the dilatation. The gauze is removed on the eighth day. He has had no ill effects, such as salpingitis, and many have had children without trouble. The operation has been done 230 times, and of 175 traced 80% have been completely cured or markedly relieved. We feel that such a shallow incision would not be of much use and that the really effective measure in this treatment is the packing which maintains the dilatation. Bell[17] accomplishes the same object in a different way. He dilates to a moderate degree, then strips the bladder back, and incises the whole cervical wall up through the internal os, it being important to open the cavity of the uterus. The superficial longitudinal muscular fibres of the cervix are sutured together and the bladder replaced. This seems a radical procedure for one cannot help feeling that the cer-

vix would be much more liable to tear along this line during labor. On the other hand the wall would be thinner there and might well dilate very easily. He gets 86% of satisfactory results.

A great deal is being written regarding the value of radium as compared to operation in the treatment of cancer of the cervix. At present the comparison, classing all degrees of involvement together, is rather in favor of radium. The mortality with radium is negligible. It is 5 to 20% with operation. There is less morbidity from radium, no hernias, fewer fistulae and quicker recovery. The percentage of cures is very nearly the same. Some inoperable and, rarely, hopeless cases are cured by radium, none with operation. This is all in favor of radium but there is still some difference of opinion in regard to the treatment of operable and borderline cases. Comparing results from different clinics is difficult because a standard method of classifying cases by the amount of involvement is not in general use and the proportion of cases which can be helped by treatment varies greatly in different communities.

This table compiled by Schmitz gives a good idea of the relative usefulness of radium and surgery classing all degrees of involvement together.

PERCENTAGES OF OPERABILITY AND RELATIVE AND ABSOLUTE CURABILITY OF CERVICAL CARCINOMATA FOR DIFFERENT METHODS OF TREATMENT

	Operability per cent.	Total number	Number cured	Relative cures	Absolute cures	Method of treatment
Clark, J. G.	17	140	12	27.2	8.6	Radium
Bailey and Healey	22	155	17	26.4	9.2	Radium
Kehrer	45.7	129	36	40.7	27.8	Radium
Doederlein	32.6	755	103	30.3	13.2	Radium and X-ray
Baisch	51	198	28	23.8	14.1	Radium and X-ray
Schmitz	17.5	103	15	50	14.6	Radium and X-ray
Johns Hopkins Hospital	52.1	387	102	46.5	26.6	Surgery
Stoeckel	70.6	350	98	35.4	26.6	Surgery
Graves	64	181	34	34.2	18.5	Surgery

Clark & Block[18] have compiled the results in 1539 abdominal operations from 10 excellent clinics and found 39.5% of 5 year cures. They quote Bailey and Healey as reporting 160 operable cases treated by radium, that is cases similar to those first quoted, with 43.1% of 5 year cures. Greenough[19] reports the conclusions reached by studying 1210 case records from various hospitals. In 243 cases of favorable and borderline cases hysterectomy alone cured 1 in 3 with an operative mortality of 1 in 5. Radium with cautery cured about 1 in 3, and radium alone or with palliative operation about 1 in 5. These cases are ones which have been treated 3 or more years before the report. He concludes that the choice between operation and radium in the favorable case is an open one and that the present day technique of applying radium should give better results than formerly. He also says, "The treatment of cancer of the cervix with inadequate amounts of radium should not be encouraged."

There are other reports of a somewhat similar nature and the trend, especially in Europe, is towards the use of radium rather than operation in favorable cases, and all agree that it is the best palliative for the unfavorable cases, especially since it cures some of them, 9% according to Clark & Block[18], 10% according to Kelly[30].

In the use of radium the trend is also towards giving one large dose or a large dosage in the first series of treatments because small doses at intervals seem to stimulate the growth in some cases and are certainly not as effective in any. To avoid the causation of fistulae the Mayo Clinic[27] give 6000-7000 milligram hours treatment with radium in doses of 700 mg. hr. every 2-3 days. The dosage in different clinics varies from 2400 to 8000 mg. hr.

X-ray is being combined more and more with radium in treating cancer. Seitz[22] had slightly better results with the combination than with radium alone. Crile[23] believes it is indicated in all cases, whether operated on or not. Jones[24] feels that better results are obtained when both means of radiation are combined. Regaud et als[25] get better results with the two than with either alone. This field is still in an early experimental stage. It may be possible, but we believe has yet to be proven, that x-ray or radium will reach metastases in the iliac glands effectively. There is still a use for operation to remove those even if the main field is treated by radiation.

The combination of radiation and operation is still on trial. Faure[26] finds preoperative radium treatment valuable while postoperative seems to increase the number of recurrences. Hunt[27] uses radium before if the whole cervix is involved and after operation in all. Mayer[28] says that if radiation is used it should be applied before rather than after operation. Monod[29] had his best results in 30 cases which had radium treatment before operation, there being only 2 recurrences 1 to 3 years after treatment. If glands were found, x-ray was used after operation. Neill[30] says that if preoperative radium treatment is used the opera-

tion should be done 5 days later. Others wait for from 4-6 weeks[29]. Neill[30] states that immediate postoperative radium treatment is useless and even dangerous. There is danger of causing sepsis in the wound and fistulae. Most authorities wait 4 weeks. Treatment with x-ray may be begun earlier, however, as soon as the patient has recovered from the immediate effects of the operation. Regaud et als[25] believe that the combination of radiation and surgery has no permanent value.

It can be seen that the treatment of cancer of the cervix is still in an uncertain state because so many different combinations of methods are being experimented with. It is certain that radium is the best palliative for inoperable cases, almost certainly the best treatment for borderline cases, and that it is preferable to operation for the favorable case in the hands of those who are not skillful in performing the Wertheim operation for cancer of the cervix. It seems probable that x-ray added to the radium may prove to be worth while and also that radiation following operation is sensible, but it will take some time longer to decide its value.

Maxwell[31] studied 500 cases of hysterectomy from the point of view as to whether it is wise to save the ovaries or not. In 329 cases in which the ovaries were removed, 80% had postoperative vasomotor disturbances such as hot flushes. Of 171 cases in which the ovaries were conserved, 42% had these symptoms. The vasomotor reactions of the normal climacteric occur in 50% of women so the latter operation compares favorably with the normal. However this protective influence of the retained ovary is not permanent as the menopausal symptoms developed in a definite number (exact figure not stated) of these cases during the first year but the change came on less abruptly than with the total ablation cases. Ovaries that were adherent were not preserved. Oophoritis of slight degree did not impair the ovarian function, and sclerotic ovaries were less effective in protecting the patient. The symptoms of the surgical menopause were more pronounced in the nervously unstable, and in the anaemic patients. In the series of 171 cases, 12 showed enlargement of the conserved ovary which disappeared in 6 months and in only 2 was pain complained of. There have been no secondary operations for neoplasm in this series. The average duration of symptoms of the normal and surgical menopause is about the same, 2½ years. The administration of ovarian extract by mouth seemed to alleviate but not entirely control the menopausal symptoms.

Lindig[32] made similar comparisons and, not stating figures, concludes that hysterectomized women with conserved ovaries behaved the same as those in which the ovaries were removed. He feels that the organism can use the ovarian secretion only if the uterus is preserved.

Transplantation of ovarian tissue is receiving more attention than it has for some time. There are two general methods, by a free graft and by a graft not removed from its blood supply. The common indication is to preserve menstruation in cases of pelvic inflammation and to give a chance for fertility in cases where the tubes have to be removed, and it is unwise to leave the ovaries in their normal position because of the danger of their becoming adherent.

Tuffier[33] and Estes[34,35] report methods of suturing the ovary at the horn of the uterus, leaving it attached to its blood supply. Tuffier makes an incision reaching to the uterine cavity so that part of the ovary is placed in the cavity. Estes freshens the surface of the ovary and sutures it to the wound made by removing the tube. Tuffier reports 23 cases in 2 of which the ovary came out through the vagina as a result of sloughing of the pedicle from constriction in the uterine wall, and one of which gave birth to a normal child. Estes gives the data from 45 cases which reported out of 95 operated on. Menstruation was fairly normal but some complained of pain in the region of the implanted ovary during it. Three had sufficient disability to require another operation. Four became pregnant.

These methods are valuable where it seems wise to try to preserve the child bearing function and are more efficacious in preserving menstruation than a free graft.

Sippel[36] has tried homeotransplantation in cases showing congenital infantilism, puerperal genital atrophy, castration during the age of sexual activity, and premature climacteric. Among 48 cases including all the above types there were 17 successful, 15 failures, and 8 were lost sight of. The results began to appear in a time varying from a few weeks to 6 months. He feels that on the whole this treatment is worth trying and even repeating in apparent failures.

Nattrass[37] cites an interesting case of autotransplantation. This patient had a Caesarian section done when 17 years old with transplantation of the ovaries into the abdominal wall to prevent future pregnancy. Her menstruation continued normally. Nine years later, during an operation for hernia one of the ovaries was examined. It measured 1¾ by ¾ inches and a section from it showed normal Graafian follicles and corpora lutea. This is cited to show the ability of transplants to survive, but we do not advocate it as the best method of procuring sterility.

Several points in the diagnosis of tubal pregnancy have been emphasized. Rubin[38] speaks of pain in the shoulder as a sign of bleeding from a tubal pregnancy. It occurs on the same side as the pregnancy, or on both sides if the hemorrhage is extensive, but affecting more intensely the side on which the bleeding occurs. He feels that this is comparable to the pain in

the shoulders caused by pneumoperitoneum. The pain produced in the diaphragmatic area is referred to the shoulders by sensitized cutaneous nerves of the cervical segments, the phrenic nerve having its origin in the third, fourth and fifth cervical cord segments and connecting with cervical peripheral nerves supplying the shoulder girdle. Eerland[39] found this shoulder pain in 55 out of 116 cases of tubal pregnancy. Irregularity in flowing as a diagnostic point is considered important by Mason and Storrs[40] and Brady[41] found it in 80% of his cases. Brady says that Cullen's sign, a bluish tinge of the umbilicus, was not found in any of his 50 cases and other writers do not speak of it, so it is probably not a common finding. Mason and Storrs[40] advise puncture of the posterior cul-de-sac with a large needle if there is a question of a pelvic abscess or extrauterine, but Eerland[39] feels that it is dangerous. It does not seem as if harm could be done however if one kept in the median line and followed the posterior wall of the uterus.

In regard to the pathology of this condition Schoenholz[42] was able to find evidence of a preceding malformation in the form of a glueing together of the tubal villi, producing the familiar mesh-like picture seen under the microscope, in 26 out of 32 pregnant tubes. This is important as evidence that most cases of tubal pregnancy are caused by the ovum being caught in one of these blind pockets. He could not find evidence that this mesh-like formation was due to a previous inflammation but it is only fair to say that most pathologists believe that it is a result of inflammation, the healed process showing no active inflammatory products. Polak[43] and Kratzeisen[44] both give unusually clear descriptions of the actual pathological process which goes on in a tubal pregnancy. Even if a decidua is formed in the tube it is not thick enough to protect the wall, as it does the wall of the uterus, so that we find an invasion of the tubal wall by the chorionic villi which have an erosive action, causing ulceration, according to Kratzeisen[44], which leads to bleeding and weakens the wall so that rupture may take place. Polak[43] found a leucocytosis of 15,000 or more in his cases. Brady[41] found an average of 11,000 in his 50 cases.

It is generally agreed that operation is the logical treatment and that abdominl excision of the tube is preferable to vaginal operation. The latter should be confined to old infected cases which need drainage only. Welton[45] uses the blood pressure as the main test of when to operate. A falling pressure calls for immediate operation. A rising pressure should lead one to wait until it stops rising. All agree that if the patient is in shock the surgeon should wait 3 or 4 hours for the partial recovery that nearly always occurs.

Bonney[46] has again raised the question of operating during the acute stage of pelvic inflammation, the operation consisting of slitting the tubes along the free border, swabbing out the exudate, tying bleeding points, and leaving the tubes in that condition. If the lining shows patches of ulceration he removes the tube. Bell[46] limits operative procedures during the acute stage to posterior colpotomy when it seems necessary, otherwise waiting until the condition is chronic.

Phillips[46] believes that the main factor is to conserve the tubes whether operation is done in the acute or chronic stage. He reports 5 pregnancies in 20 cases operated on conservatively.

Most authorities favor conservatism as regards operation. Of 8403 cases of pelvic inflammation in the Second Gynaecological Clinic of Vienna[47] only 5% were operated on. The abdominal operation showed better results than vaginal operations, because there was less chance of leaving diseased tissue behind. About 25% of those conservatively treated, that is with the pelvic organs saved so far as possible, had a continuation of symptoms attributed to exacerbations in the tissue left. They feel that only the most radical operation gives a good chance of permanent recovery and they are reluctant to advise this in young women.

Schmidt[48] reports that of 1840 cases seen at the Bonn Clinic, 8.8% were operated on. They wait for 3 months after the acute stage using local treatment before advising operation. They did 120 conservative operations and 42 radical. They had poor results in 21.5% of the former and 6% of the latter but in spite of this they advise conservation in young women. Vasomotor symptoms and psychic changes occurred in 57% of the radical cases and especially in women who were neurotic before operation so they advise aaginst castration in nervous women.

Sellers[49] emphasizes especially that patients with postpartum infections should be treated with rest and local treatment longer than gonococceal infections before resorting to operation, that they should lead an inactive life for months, spending as much time as possible in resting. The reviewer believes that this is a point frequently overlooked, that it is very important, that this type of case is more likely to be stirred up by a conservative operation, that most of them will get well if given time and the proper treatment, and many will be able to have children. The proper treatment would consist of bed and copious hot douches during the acute stage, usually 3 to 6 weeks; dressings and douches for 2-4 months; and then the wearing of a pessary for at least 6 months to prevent retroversion if possible. Especially important is sexual rest for the first 4 to 6 months.

In accordance with this are Curtis[50] investigations of 300 cases which showed that streptococci may remain viable in the tubal tissue for months or years while gonococci die out quickly and also, for this reason, if operation is done,

more radical procedures should be used in the former cases.

It may be said then that the general opinion still is that conservatism should be practiced in deciding to operate and in doing the operation for pelvic inflammation. It should also be realized however that the class which has pelvic inflammation is generally the poor; they have to earn their own living; and must be gotten well as soon as possible so that they are more likely to need operation and, especially radical operation, from the economic point of view than those in better financial circumstances.

Kraul[51] and Naujoks[52] believe that vaccines are of help in treating chronic gonorrhoea, that is cases of salpingitis in the quieting down stage. Autogenous vaccines are the most beneficial but cultures during this period are difficult to obtain so Naujoks depends especially on fresh cultures from a case of gonorrhoea to be used in 4 to 6 weeks. Kraul reports 66% of favorable cases and Naujoks 70.4%. This therapy is contra-indicated in the acute stage; where there are pelvic masses with fever; in cases showing a violent reaction; and when lesions of the lungs, heart and kidneys are present.

Bittmann[53] reports the results in 573 cases of pelvic inflammation treated with the intramuscular injection of 5 c.c. of boiled cow's milk on alternate days for 5 doses. 76% were cured, 20% improved, and 4% showed no beneficial result. Following the injection the temperature goes up in 3 to 5 hours with chills; the fever continues for 24 hours and gradually goes down. Gonorrhoeal and streptococceal processes are more favorably influenced than others. Del Sole[54] and Lauenstein[55] also report good results in small series of cases. This seems to be a method of treatment which has not been tried out to as great an extent in this country as in Europe and it would seem from the reports that have appeared in the last 5 years that it was worth resorting to.

The use of various extracts of animal ovaries, chiefly pig and cow, to treat abnormalities in menstruation, symptoms of the menopause, vomiting in pregnancy, etc., has continued with conflicting reports in regard to results. There is no unanimity of opinion as to what part of the ovary to use in making the extract, whether to use extracts or desiccated ovarian tissue itself, or whether to give it by mouth or hypodermically.

First of all the specific substance or substances produced as an internal secretion by the ovary have not been chemically isolated. Wintz[56] and Fellner[57], who have been working on this problem for years, have continued but still have produced only an extract containing a lipoid which seems to promote growth of the uterus, vagina and the breasts (Fellner), and decreases functional bleeding (Wintz) but increases bleeding due to a fibroid (Wintz). Allen and Doisy[58] have aspirated the liquid in follicles of hog ovaries and by injecting this, or an alcohol-ether extract of it, into spayed mice and rats they have produced estrual changes in the uterus and vagina. They conclude that this is a hormone produced by the cells of maturing follicles which is not species specific but is probably common to all female animals. Radecki[59] has examined 120 human ovaries for the lipoid content of the corpus luteum at various stages and found that it is abundant in the corpus luteum of menstruation but diminishes at the beginning of pregnancy.

All these experiments give promise of finding a specific substance, such as is obtained from the thyroid, some time in the future.

Sharlit, Corscaden, and Lyle[60] desiccated cow and pig ovaries by a method of their own and put it up in 4 grain capsules. These capsules were taken orally by 50 patients complaining of hot flushes, indicating ovarian dysfunction. They report disappearance of the hot flushes in 30 days after the beginning of the treatment in all these cases, and, in the majority, the relief from other symptoms of the climacteric.

Floris[61] used ovarian preparation hypodermically in 202 cases of hypoplasia of the genitals and various disturbances of menstruation with satisfactory results in almost all.

Echemendia[62] got better results with extracts of the ovary and corpus luteum in functional menorrhagia by hypodermic than by oral administration.

Zondek[63] as a result of experiments concludes that progress in organotherapy cannot be made with extracts as the specific substance is destroyed and that at present only the chemically unchanged dried preparations should be used.

Rogers[64] believes that a glycerin extract of the pig ovary is the most useful. He finds ovarian therapy useful only in the hot flushes of the menopause, functional dysmenorrhoea and occasionally in functional amenorrhoea.

Frank[65] concludes from his experience in using ovarian extracts that they are inert and useless.

In general then this subject is in an experimental stage. Hypodermic injection of the extract seems to be of more benefit than oral administration. The personal equation, both on the part of the patient and the physician, plays a marked part in deciding whether treatment does good or not. It is fair to say that there are few reports as pessimistic as that of Frank[65].

The effect of radiation, used to treat menorrhagia and fibroids, on future children must be considered because such therapy affects the Graafian follicles in the ovary and it is easily conceivable that the ova might be damaged enough to cause defective children. Driessen[66] concludes from experiments that the germ cells may be so injured that deformed children are born. Bailey and Bagg[67] report pregnancies in 3 patients previously irradiated with x-ray. One had been treated for Hodgkin's disease and she was delivered of a mal-

formed child. The other two were treated for fibroids and one had a still-born child and the other a normal one. They do not consider that there is enough evidence to warrant contributing these two defective children to the radiation but they feel that it would be wise to cause complete sterility in treating menorrhagia rather than leave germ plasm which may be permanently damaged.

Lacassagne[68] x-rayed rabbits and found that it caused a reduced number and viability of the young but those which survived were normal.

Naujoks[69] x-rayed 86 women to cause temporary sterility because of constitutional diseases like tuberculosis, nephritis, etc. Two of them later became pregnant, one of whom bore a normal child and the other had her pregnancy interrupted for therapeutic reasons.

Pemberton[70], reporting Graves' cases, found 4 pregnancies in 25 women in the child bearing age who had had radium for functional menorrhagia. One had twins, one a normal baby, one had eclampsia at 7½ months and one had a miscarriage. A survey of the literature led him to the following conclusions. It is evident that normal children can be born following x-ray and radium treatment. It is probably true that deformed or undeveloped children are no more likely to occur after such treatment than normally. It does seem true that the chance of a miscarriage is greater following radiation. It may be that an ovum damaged by radiation either is not capable of being fertilized or results in a blighted ovum. Much more investigation must be carried out to settle these points and also whether mild radiation results in sterility even though the patient continues to menstruate.

Radiation of the foetus in utero is quite another story. It frequently results in undeveloped, deformed and mentally defective children and should be carefully avoided. This is more true if the radiation is done during the first 4 or 5 months of pregnancy than at the end. Optic atrophy, defective eyes and microcephaly are characteristic changes found in such infants and in experimental animals[67, 71, 70, 72].

Sampson[73], following out his theory of implantations of particles of endometrium which reach the pelvic peritoneum and ovary by a back flow through the tubes during menstruation and cause "chocolate cysts," calls attention to the fact that these implantations may be the origin of carcinoma of the ovary. Also if this happens in cases of carcinoma of the endometrium metastases in the pelvis may result. Further this brings up the question of dissemination of this type of cancer during pelvic examinations, curettage, and the application of radium. He found particles of cancer lying free in the tubes in 4 out of 7 specimens of cancer of the body of the uterus removed by operation. Therefore any examination or instrumentation should be very gentle and curettage employed only in doubtful cases. Radium should not be used because the radium tube acts as a plunger in a syringe, forcing material out through the tubes. The idea is logical and the writer gives convincing proof. The ideal treatment then is a complete hysterectomy with as little manipulation as possible. We believe that in cases of cancer of the endometrium it is wise to close the cervical canal with a suture as a preliminary and, instead of merely clamping the tube close to the uterus, it would be wise to close the fimbriated ends as the first step after opening the abdomen, to prevent leakage of malignant material.

Von Jaschke[74] and Graff[75] believe that the etiology of prolapse lies in a constitutional inferiority of the whole organism in the majority of cases and that the injury done by childbirth is a secondary or inciting factor. Graff states that if such a natural process as birth is of exclusive importance in the occurrence of a condition that severely injures the functional capacity of women, it should follow that in primiparae prolapse would be comparatively rare, whereas in multiparae it would be more frequent and more severe, but no such law can be demonstrted. We believe that this is true in many cases but also there are many in which the seeming constitutional inferiority is a result of long continued irritation from the pelvic condition. In writing on backache Graves[76] speaks of the almost universal symptom of general exhaustion which is complained of by patients with genital prolapse and says that even if the patient has orthopedic troubles as well as the prolapse, they are often relieved and sometimes entirely cured by a reconstructive operation because the operation removes a source of exhaustion that has been increasing the effect of the orthopedic strain. He also speaks of diastasis of the recti muscles, which is commonly found associated with prolapse secondary to child bearing, as a cause of backache. The repair of this condition is neglected by many surgeons in operating for prolapse but it is a very important factor in getting the patient back to a normal anatomical condition.

Paine[77], as a result of an analysis of 3000 cases of retro-displacement of the uterus, calls attention to the fact that the symptoms are due largely to associated conditions such as developmental deficiency, pelvic inflammation, and child birth injuries, rather than to the malposition of the uterus. Therefore an operation for simply correcting this condition alone is not good treatment. This point has been stressed by gynaecologists for a long time but it is fairly common still, in our experience, to see patients with marked lacerations who have had only a suspension done, who are not relieved of their symptoms, and who would have been relieved if plastic operations had been done on the vagina in addition. Graves' term, a "reconstructive operation," is a good one in this con-

nection for it consists of several operations combined, each one of which is of importance in attaining the final result.

In a series of articles Reynolds and Macomber[78, 79, 80, 81] go over the question of sterility, its diagnosis and treatment. They call attention especially to the many variable factors which are involved but which have not been emphasized until recently, such as the effect of diet, constitutional diseases, toxemias, and the general habits of the patient. A diet deficient in iron, iodin, calcium, protein, or vitamins may be a cause of lowered fertility. The acute diseases such as typhoid, pneumonia, and the acute infectious diseases may cause a temporary lack of fertility. Anemia even of slight degree may be an important factor. Focal infections and toxemia from drugs, alcohol, and chronic constipation should always be considered in making diagnosis. One of the most neglected points is the lowering of fertility, on the male side especially, which may take place on the change from an athletic college life to a sedentary business life.

Various modifications of the Rubin insufflation test have been devised. Heaney[82] believes that the diagnosis of non-patency of the tubes can be determined by using a one ounce rubber ear syringe with which to force air into the uterus. If the syringe empties and back flow through the cervix is ruled out by filling the vagina with water or putting lubricant around the nozzle of the syringe, then the tubes are patent. If it only half empties they are closed. The fault in this method is that the amount of pressure used is a personal equation and it seems probable that damage by tearing adhesions could be done by inexperienced operators.

Curtis[83] used insufflation through the fimbriated end of the tube with a Luer syringe during operation to demonstrate obstructions, strictures, and the patency of the reconstructed tube. The writer of this review used this method following reconstruction of the tubes in one case in which the air that was blown into one tube came out through the other, thus conclusively demonstrating the patency of both tubes. The supposition was that the cervical canal was blocked by blood clot resulting from a curettage done just before opening the abdomen.

Kennedy[84] injects sodium bromide solution into the uterus and takes x-rays to see if the solution has entered the tubes. He reports 18 cases. If the tube is patent the solution will cast a shadow in the ampulla of the tube or in the pelvis on the side of the patent tube. Of the tubes examined 30.8% were occluded at the isthmus and 69.2% at the fimbriated end. These figures would seem to demonstrate the importance of Curtis'[83] method because if one relieved an obstruction at the fimbriated end there might still be one at the isthmus which could not be demonstrated with a probe. Stone[85] overcomes this doubt by having fluid injected through the uterus while the abdomen is open to see if it comes out of the tubes.

Transuterine insufflation has some value as a therapeutic agent according to Peterson[86], Meaker[87] and others by breaking fine adhesions, straightening out kinks, or blowing secretion out of the tubes. They report a few pregnancies following such treatment alone.

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ORIGINAL ARTICLES

FRANCIS H. WILLIAMS, M. D., PIONEER AND CONTEMPORARY*

BY FREDERICK W. O'BRIEN, M. D., BOSTON

Address of President of New England Roentgen Ray Society Prepared to be Read Before the American Roentgen Ray Society in Annual Session at Swampscott, Sept. 3, 1924

Gentlemen:—

I feel singularly honored to be able to extend you the heart-felt greeting of the members of the New England Roentgen Ray Society, an organization that first came into being on May 6, 1914, when some nineteen men, at the call of Dr. Arial George, met at the Harvard Club, Boston. During its first few years, it functioned in rather an informal manner. Then under the stimulus of Dr. George Holmes, on December 29, 1919, the Society was formally organized with charter and by-laws. At that time, there were 32 members. Today, the Society has 50 members, 33 of whom are members of the American Roentgen Ray Society, to which we, as a Society, look for inspiration and edification.

When New England is mentioned, one's mind instinctively associates with it the history of our country. I grasp this occasion not only to welcome you to these historic shores that saw the beginning of our nation, but to direct your thoughts to the history of the roentgenology and ask you to join me in tribute to one of our number, Dr. Francis H. Williams, to the end that we may disprove, belatedly perhaps, it is true, the biblical tradition of a prophet being without honor in his own country.

Roentgen discovered the X-rays in 1895, and in 1896, when still but the plaything of the physicist, Dr. Francis Williams, working at the Boston City Hospital, had so far mastered them as to apply them in a wide field of usefulness in medicine and surgery.

I wonder how many of you gentlemen have read "The Roentgen Rays in Medicine and Surgery," written by Dr. Williams and published by Macmillan in 1901. It has long been out of print. I do not call it to your notice as a collector of first editions but because of the inherent value of the text itself, done so well that with the passing of a quarter of a century, none of it has been gainsaid. Certain portions now could be elaborated and certain other portions would appear to stand for all time.

That is high praise for an early work on a subject which today is talked of as still in its youth.

Take his study of the thorax. There is very little he left unsaid. The signs we teach today as necessary to a diagnosis of intrathoracic pathology, were in great measure, all described by Williams. With the instinct of a thorough student, he not only made X-ray studies of the living but of the dead. He described the X-ray appearances in the tubercular lung, both in vivo and post-mortem, and advocated repeated examinations of lung cases to note progress or retrogression of the disease; a counsel of tremendous significance and neglected commonly today.

He described the appearance of early pneumonia on the fluorescent screen, a method of examination rediscovered in this country during the World War. By the fluorescent screen he taught the differential diagnosis of central pneumonia and appendicitis.

He proved the occurrence of pneumonia with "la grippe" in the absence of auscultatory signs. In 1896, he demonstrated by the X-rays the inaccuracy of percussion in determining the size of the heart.

He worked with Cannon in his early studies

*Owing to illness in the family of Dr. O'Brien it was necessary that the paper be read by title.

on intestinal motility and suggested the use of bismuth in the study of the gastro-intestinal tract of humans, the perfection of which he has witnessed.

The Roentgen examination of the gall bladder appears to us as something of recent date, but Williams experimented in 1896 with calculi from the kidney and gall bladder "using a measured depth of water equal to body tissue in density in comparison," and concluded as if written yesterday, "we may expect to detect calculi by the rays, when they contain certain inorganic matter, that is mineral substances, but if they are made up of organic matter, I think they can be photographed only with difficulty, because stones made up of uric acid are penetrated by the rays about as easily as the soft tissues of the body."

His observations and conclusions on treatment by X-rays from a biological and morphological point of view are altogether in accord with present-day teaching.

"The time has not yet come," he writes, "to make too definite or final a statement in regard to the value of the X-rays as a curative agent in various forms of new growth. It is very evident, as our experience increases, that different kinds of new growths vary in the manner in which they respond to X-rays."

"Some of the groups of new growths yield slowly to the action of the X-rays and a certain percentage of them do not yield; while in other groups, response to the X-rays is rapid, and nearly, if not quite all, in these groups yield to them."

Williams was the first to prove that cancer of the lip could be cured by X-rays without producing any escharotic effect. This was in 1901. At that time the teaching was to use a dosage that would so burn the lesion that healing would not take place for six weeks. Williams, at that time, maintained that the value of X-rays in treatment lay in their selective action. He was one of the first in this country to use radium.

I could but wonder in reviewing Williams' work on therapy if our reputed progress were anything more than one of words. For the most part, his end results compare favorably with our own.

Dr. Williams, before studying medicine at Harvard, had graduated from the Massachusetts Institute of Technology, which gave him the background necessary for his experimental work. None better than you gentlemen interested in therapy appreciate the necessity of a knowledge of physics in this field of medicine.

He early recognized the importance of protecting the human body from X-rays and recommended lead paint to cover tubes, lead glass for the fluorescent screen, and sheet lead for partitions and walls. Indeed, if his repeated warnings were heeded, I question if so many beloved fellow workers need have passed on in martyrdom.

Dr. Williams enjoys undiminished mental and bodily vigor. You will have the privilege of listening to him during this meeting.

I will not here attempt to narrate the achievements of other New England pioneers in roentgenology or of those men, our active contemporaries, whose work and worth are known to you all.

I am not unmindful of the debt we owe to those of you from outside New England who have done so much to advance the art and science of roentgenology.

We, as roentgenologists, are proud of our heritage and ask you to share it, trusting that your visit with us will serve to store up memories, many and beneficent.

PREVENTIVE MEDICINE FROM YOUR FAMILY PHYSICIAN*

BY EUGENE R. KELLEY, M.D., BOSTON

Commissioner of Public Health

Some time ago our attention was forcibly drawn to the number of cases and deaths from diphtheria that were secondary to an earlier case in the family. This was reported by Carey.† In seeking for a means to control this, a letter was drafted addressed to the Head of the Family, and to be sent in each case of diphtheria reported. This was very similar in spirit to a letter which has been sent out for some years by the Department in all reported cases of typhoid fever, and which has had some influence in furthering the protective inoculation of contacts. The diphtheria letter also dealt with the immunizing of contacts, but since there is a considerable diversity of opinion as to the relative merits of active and passive immunization, under these circumstances the distribution of the letter has been withheld. However, a copy of the proposed letter was sent to all registered physicians within the State, amounting to nearly 6,000, with the request that they comment on it. Sixty, or 1%, so commented. Fifty-four of the replies were favorable to the general tenure and spirit of the letter, though many suggestions as to the phraseology, the relative merit of active and passive immunization, and the like, were made. The general sentiment expressed was that the letter would be a distinct help in reënforcing the advice already given by the physician. Six were unfavorable to the letter. One even asserted that the suggestion that the head of the family consider with his private physician the advisability of protecting uninfected members

*From the State Department of Public Health.

†1922 Annual Report, Department of Public Health.

of his family from diphtheria was an example of State medicine.

Although the interest in the matter, as judged by the number of replies, was slight, still among those who did write the sentiment was so overwhelmingly favorable that the matter has been the subject of considerable thought and discussion in the Department since. Out of the discussion there came a suggestion from a general practitioner that has been developed into another letter to the doctors throughout the State. It was held that there is an increasing number of physicians urging preventive inoculations and health examinations upon their patients and their patients' families. This advice would be reënforced by a card from the Department of Public Health regarding these matters. This fitted in precisely with the feeling of this Department and of Health Officials generally, namely, that the ultimate unit in the practise of preventive medicine, as in that of curative medicine, is the private physician. Hence we welcome this method of demonstrating this belief.

On April 1st, the following letter with an enclosed card will be sent:

Dear Doctor:

Of the communicable diseases prevalent in this part of the country there are at least three for which a safe and effective prophylactic procedure exists: i. e., typhoid, smallpox and diphtheria. In the last twenty-five years the frequency of these diseases has been reduced, but at the present rate their elimination is still a long way off.

Another sound preventive measure is the periodic health examination. Since 1905 the death rate from communicable diseases has been cut almost in half, while that from degenerative diseases has increased almost one quarter. The periodic examination of the supposedly well is certainly a sound approach to the control of this mounting death rate from degenerative disease.

It has long been recognized that the private physician is in the strongest possible position as a teacher of preventive medicine to his patients and their families. A word from him will carry more weight than volumes of printed matter. People are coming to him more and more for such advice. On the other hand there is considerable reticence among many physicians to take the initiative in recommending preventive measures which will directly increase their incomes lest they lay themselves open to criticism.

In an effort to overcome this embarrassment the State Department of Public Health has prepared the enclosed card recommending that persons go to their private physician for prophylaxis against smallpox, typhoid and diphtheria, as well as for periodic health examinations for themselves and for their families. It is hoped that you may use this card both in professional letters and on the table of your waiting room.

Yours very truly,
EUGENE R. KELLEY, M.D.,
Commissioner of Public Health.

(Card)

COMMONWEALTH OF MASSACHUSETTS

DEPARTMENT OF PUBLIC HEALTH

PREVENTIVE MEDICINE FROM YOUR FAMILY PHYSICIAN

There are at least three common diseases that can be prevented. Any case of these diseases in your family means that available methods have not been used.

1. Smallpox may be prevented through vaccination. Recently smallpox has been widely spread over the country and in some places it has been of the malignant type.
2. Typhoid fever may be prevented through the periodic injection of typhoid vaccine. "Vacation" typhoid is mounting with the increased crowding of the country.
3. All your family can be protected against diphtheria. Your private physician will explain how.

Diseases of middle life due to "wear and tear," such as Bright's disease, arteriosclerosis, cancer and diabetes are increasing. These diseases can be combatted by corrected habits and early recognition. Periodic health examinations at all ages may save you from these diseases.

Talk these matters over with your physician.

At a later date we will report the reception which this card receives.

DR. PARK HEADS MILBANK DEMONSTRATION

DR. WILLIAM H. PARK has been made medical officer of the New York City health demonstration, aided by the Milbank Memorial Fund, according to an announcement by Dr. Frank J. Monaghan, Commissioner of the New York City Department of Health. At the same time the appointment was also announced of Dr. J. L. Blumenthal of the Bureau of Child Hygiene, Dr. Louis I. Harris of the Bureau of Preventable Diseases and Dr. Shirley W. Wynne of the Bureau of Hospitals to be assistant medical officers.—*Bulletin N. Y. Tuberculosis Assn.*

TWO CITIES WITH NO TYPHOID DEATHS IN 1924

WE are proud of the record of Fall River and Hartford. These cities reported no deaths from typhoid last year. New England in general stands high among the states demonstrating efficiency in dealing with health problems.

Case Records of the Massachusetts General Hospital

ANTE-MORTEM AND POST-MORTEM RECORDS AS USED IN WEEKLY CLINICO-PATHOLOGICAL EXERCISES

EDITED BY

RICHARD C. CABOT, M.D., AND HUGH CABOT, M.D.

F. M. PAINTER, A.B., ASSISTANT EDITOR

CASE 11131

MEDICAL DEPARTMENT

An Italian housewife of twenty-two entered April 20. She had had two children and one miscarriage. She had had no catamenia for four months, and during that period had had dyspnea and cough. For the past two weeks the cough had been worse and she had had bad color, pains in the joints and very little urine.

Examination showed cyanosis of the whole body, marked about the lips, cheeks, tongue, ears and nails. The hands and feet were cold. There was slight glandular enlargement. The lungs were normal except for slightly harsh respiration at the left apex. The apex of the heart was in the fifth space in the mammillary line. The left border of dullness was just to the left of the nipple line, the right border three finger-breadths to the right of the sternum. There was no thrill, but a duplicate impulse was felt. At the apex was a harsh systolic murmur transmitted to the axilla and heard over most of the cardiac area. Just at the end of the murmur two short sharp sounds were heard faintly. At the base the sounds were very feeble, with accentuation of the pulmonic second. The liver extended to a handbreadth below the costal margin and was somewhat tender. No enlargement of the uterus was made out. There was slight edema of both legs.

During her thirteen days in the hospital she ran an irregular temperature, 97-101.5° with one drop to 95.6° followed by two days of subnormal temperature. The pulse was 83-113, the respiration 22-36. The output of urine was 13-70 ounces, the specific gravity 1.013-1.028. All of three examinations showed albumin 1/20-1/6 per cent. The sediment at one examination showed a few abnormal red blood cells. There is no record of the blood except leucocytes 8,200.

Under rest and purgation the patient made marked improvement. The edema decreased, her color improved, and the liver became smaller. May 2 she was discharged relieved.

After leaving the hospital she was fairly well until early in June, when edema of the legs and dyspnea returned. At her readmission to the hospital June 22 she was unable to use the right half of the body.

Examination now showed her very cyanotic, with right hemiplegia. The whole surface of the body was cool and the extremities cold. Over the back and the sides of the chest was a brownish maculopapular eruption. The bases of the lungs showed edematous râles. The apex impulse of the heart was felt in the fifth space two inches outside the mammillary line, forcible and very diffuse, coinciding with the left border of dullness. The right border was three finger-breadths to the right. The systolic murmur was heard all over the cardiac area except in the aortic region. Over the tricuspid area it seemed to have a higher pitch. The heart sounds were confused, rapid, and at long intervals intermittent. The pulse was rapid and very slightly intermittent. The right leg was much more edematous than the left. No knee-jerks were obtained. The examination was otherwise as before.

The temperature was 97.7°-99.7°, the pulse 80-107 until July 3, then July 4 and 5 swinging from 53 to 108, dropping to 67 July 7. The urinary output was 10-33 ounces except one day when it reached 45 ounces; cloudy, specific gravity 1.025-1.009. The sediment showed leucocytes at both examinations and a few red blood corpuscles at one.

The edema and hemiplegia gradually decreased and the cyanosis cleared a little. The cardiac condition remained unchanged. July 4 the patient's sister died of heart trouble. July 7 the patient insisted upon going home.

After leaving the hospital she grew more cyanotic and became blind except for recognizng light. Pain developed about the liver and she became unable to lie down.

Upon examination at her third admission, July 29, she showed external strabismus of the right eye and internal strabismus of the left. She could bring the eyes to the median line but not to the left side. She appeared wholly blind. The pupils reacted to light. The lungs were negative. The cardiac impulse was barely palpable. The percussion measurements were as before. The systolic murmur was faint at the apex, transmitted into the axilla. At the tricuspid area was a faint systolic blow of higher pitch than the apex systolic. The pulmonic second sound was slightly accentuated. The sounds were much fainter than at her last stay in the hospital. The base sounds were very weak. The liver was three finger-breadths below the costal margin, hard, somewhat tender. The legs showed no edema. The left upper thigh was larger than the right, tender along the femoral vein, hard, resistant. The patient cried out with pain upon pressure over Scarpa's triangle. No paralysis was made out, merely equal sided weakness. The rash was generalized over the body. No urine could be obtained for examination. The blood is not recorded.

During her three days in the hospital she ran

a temperature of 101.3°-103.4°. The pulse was 120-130. The respirations were 30-15. The day after admission the tenderness and swelling over the left femoral vein had largely cleared up. The general condition however was worse. There was much more cyanosis. The systolic murmur was loud at the apex. She gradually failed, became purple, yet showed no edema of the lungs, abdomen or legs. July 31 she died.

Discussion

BY DR. RICHARD C. CABOT

NOTES ON THE HISTORY

When a record goes into cyanosis with as much detail as this we know that it is not just the ordinary cyanosis that any heart case or any lung case has to some degree. It must be some unusual degree of cyanosis such as would strike the eye at once, probably due to some unusual cause.

I do not know what "duplicated impulse" means. Of course one can feel a reduplicated sound quite often, especially the duplication of the pulmonic second at the base, and I think that one might feel a reduplicated first sound, not constituting a genuine impulse but something palpable corresponding with the sound. The "short sharp sounds" of course should be the aortic second sound reduplicated.

Before we go on let us make our best guess as to what they thought at the time of her first discharge. There is very little on which we can safely base an inference. I should think the first point of importance was her age, twenty-two, an age at which we seldom get any variety of valvular disease except rheumatic. Then the fact that there was no history of childhood disabilities such as would usually go with a congenital lesion. Although she may have had a congenital heart lesion there is nothing here to indicate it. A syphilitic lesion would be unusual at her age. So if she has not a congenital lesion or a syphilitic lesion I should say she had a rheumatic heart lesion, arguing chiefly from her age and a little from her sex, because it is more common in women. If a rheumatic heart lesion the chances are it is a mitral stenosis, because that is vastly commoner than any other.

NOTES ON THE PHYSICAL EXAMINATION

The examination is perfectly consistent with mitral stenosis. We often get, in addition to what is recorded here, either a presystolic or a middiastolic murmur if we watch for it and bring it out. The great point of mitral disease which is missed by most people at the present time is to know when it should be there and to go after it without resting content with what is found at the first examination. By going after it I mean (1) trying the effects of exertion if the patient is in fit condition to exert himself or herself; then (2) giving nitrite of amyl pearl and watch to see if just during the ten to fifteen seconds that that lasts we can get a presystolic murmur,—a very helpful diagnostic procedure when one is in doubt. (3) If the patient is lying perfectly at rest, to watch for a murmur right in the middle of diastole, at a time when our ears are not attuned to watching for anything. It will be found that our hearing is much sharper at one period than at another, and it will be much sharper when we are listening for something in the middle of diastole. We are accustomed to listen for murmurs in the beginning and in the end, not in the middle of diastole. There are a lot of middiastolic murmurs to be heard that I never heard until five years ago, until they were pointed out to me. Most people do not hear them until they are pointed out. This is a very important murmur because it is a very early murmur in mitral stenosis. I should say that certainly forty-nine fiftieths of the medical profession that I have tested never hear that murmur. When they do they say it is a new experience.

It is of course perfectly possible that all this argument is wrong and that it is a congenital case or an adherent pericardium; but so far the evidence is the other way, I should say.

At the second entry she had a hemiplegia. That tends to reinforce our guess as to the diagnosis, for in a young person hemiplegia with heart disease most often means embolism from a clot in the left auricle behind a stenosed mitral.

"Edematous râles" is a poor term. It means râles interpreted as edema.

The apex impulse of the heart is farther out than before, but as before we get only a systolic murmur. There was auricular fibrillation.

We have nothing, it seems to me, at either examination, to make us think the kidney is diseased.

The blindness is difficult to explain. The two foremost possibilities are a uremic condition which we have not had suggested and an embolism of the retina.

The temperature chart showed marked swings up and down during the days when she must have been troubled by her sister's death.

At her third admission the high temperature came perhaps from the phlebitis which she seemed to have.

"No edema of the lungs, abdomen, or legs." That is put in as if intended to be significant, and I think it is significant.

DIFFERENTIAL DIAGNOSIS

There are three things that we ought to think about here in differential diagnosis. One I have already considered as well as I can,—rheumatic mitral stenosis. As time goes on it does not sound as probable as it did to me in the beginning, because we have no good evidence of fibrillation, although it is suggested by one of the phrases in the record, and because the amount

of dropsy is much less than we expect in a death from mitral stenosis.

There are some suggestions of syphilis here. She has had one miscarriage, and she has a rash the nature of which we do not know in detail, which might be a syphilitic rash. I cannot say any more about it without further description.

The third possibility is of a congenital lesion. That is suggested by the cyanosis, which as I said at the outset was apparently out of proportion to what we expect in most cases of heart trouble. Then the fact that there is a murmur on a different pitch apparently over the tricuspid area, which might go with a congenital lesion, and especially the lines at the end, "became purple yet showed no edema of the lungs, abdomen or legs." Of course that last might be due to pulmonary embolism. She has had something to make us think of embolism in the brain and in the leg, and pulmonary embolism of course is perfectly possible in a case like this, though we have to realize that it means a thrombus in or passing through the right side of the heart. We cannot suppose it with a left-sided lesion alone.

Against congenital lesion is chiefly the point I have urged already, that we have no history of any disabilities in childhood. The majority of diagnosable congenital lesions show themselves in childhood.

On the whole then after balancing these three possibilities, syphilis, rheumatism, congenital defect, as best I can, I come back to the point I originally started from. On the whole it seems to me a little more like a rheumatic lesion and as if the tricuspid as well as the mitral was involved. I feel very uncertain about the case because of the way it is recorded and the lack of a good many things we should like to know to identify or exclude mitral disease.

Outside the heart we ought to have evidences of embolism I suppose in the brain, I suppose a thrombosis in some of the leg veins—not arteries, because we do not have anything suggesting gangrene—and if in those two places presumably elsewhere, though I cannot say in particular where.

This was in 1898, twenty-seven years ago, so it is natural that I should complain more or less of the record.

MISS PAINTER: Is it possible that they did not get a good history because she was Italian?

DR. CABOT: I think it is more than possible because of her race and the difficulty of language they did not get all the history and what her mother might have known as to early rheumatism or cyanosis.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Chronic endocarditis. Mitral regurgitation.
Congenital heart lesion.

DR. RICHARD C. CABOT'S DIAGNOSIS

Chronic endocarditis of the mitral and tricuspid valves. Mitral stenosis.
Embolism and thrombosis.

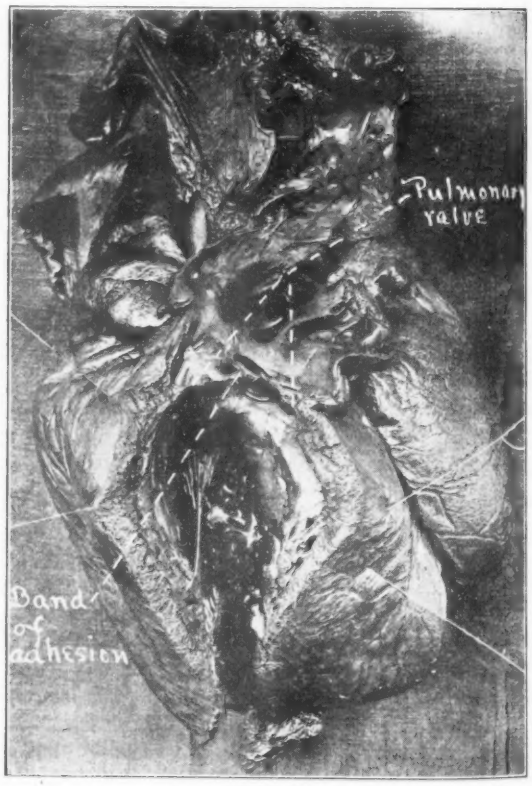
ANATOMICAL DIAGNOSIS

Stenosis of the pulmonary valve of the heart (congenital malformation?)
Verrucose endocarditis of the tricuspid valve.
Partially patent foramen ovale.
Hypertrophy and dilatation of the right ventricle and the right auricle.
Thrombosis of the right auricular appendix, of the right ventricle, and of the left ventricle.
Infarctions of the kidneys.
General chronic passive congestion.

DR. RICHARDSON: There was no edema of either the upper or the lower extremities. There was some ascites, moderate hydropericardium, no fluid in the pleural cavities. There was some congestion of the lungs, and there were old pleural adhesions on the right side.

The liver was one hand down.

The heart weighed 631 grams,—marked hypertrophy. The right ventricular wall measured



CASE 11131. Right heart in pulmonary stenosis, showing the valve laid open, with a band of adhesion from the cusp. The ventricular walls are thickened.

from twelve to fifteen mm. the left ventricular wall ten mm. There was slight dilatation of the

right ventricular cavity, much dilatation of the right auricle.

DR. CABOT: That is, the right ventricle was actually thicker than the left? That is extraordinary!

DR. RICHARDSON: The wall of the right auricle was four to five mm. thick; the left negative. There was slight dilatation of the left cavities.

The aortic and mitral valves were negative. There were mural thrombi in the left ventricle. On the tricuspid valve there were a few small firm fibrous granules,—the so-called verrucose endocarditis. The cusps of the pulmonary valve generally were fused, thickened, a smooth fibrosis, and from the three bands extended on the pulmonary artery, the whole process producing pulmonary stenosis, congenital. There was also a partially patent foramen ovale. There were mural thrombi in the right ventricle and the right auricular appendix.

The liver, spleen, and kidneys showed chronic passive congestion. From the mural thrombi on the left side there were infarcts in the kidneys.

The mucous membranes were markedly purple.

DR. CABOT: Pulmonary stenosis is one of the severe congenital lesions. I do not believe for a moment that that child had failed to show cyanosis and heart murmurs much earlier. I entirely believe, as Miss Painter suggested, that if we had got a decent history here I should not have gone so entirely wild as I did.

CASE 11132

SURGICAL DEPARTMENT

A married Canadian laundress of sixty entered March 10.

F. H. Good.

P. H. She had scarlet fever and smallpox when a child; no other serious illnesses until the present one. She had had to do hard work to support her husband and three children for twenty years, and felt worn out. For five weeks she had felt miserable.

P. I. Two weeks and a half before admission she had sudden onset of cramps in her feet, and both legs felt numb to the knees. There was pain below the knees. The right leg was better in a few hours, but the left had continued numb and painful. A day or two later she began to be dyspneic and noticed that her heart beat fast and irregularly. She had had cough recently, especially at night.

P. E. Fairly well nourished. Mucous membranes pale. *Heart.* Systolic murmur in the axilla. Pulse weak, irregular and intermittent. *Lungs.* Numerous squeaks and grunts. *Abdomen* negative. *Extremities.* Left leg below the knee enlarged, firm and painful on pressure. Vessels in the calf blue and cord-like. Foot blue-black to above the ankle. Femoral pulse felt in groin and above the popliteal space. Right foot negative.

Before operation temperature 97.2°-100°; pulse 150 at entrance, afterwards 90-115; respiration 27-31; *urine* and *blood* not recorded.

The patient was given strychnia gr. 1/40 every four hours and tincture of digitalis minims x t.i.d. with good result. The pulse became much more steady and better in quality. The toes became dry and black and an area of redness appeared below the knee. She complained of pain in the precordia and the right thigh and leg. March 16 the right foot was slightly cold. An icebag over the heart gave some relief. March 17 she felt better, had less pain and the pulse was better, though still rather weak and very irregular.

March 18 the left leg was amputated at the junction of the lower and middle thirds of the thigh. Pathological examination showed the foot and leg entirely black and gangrenous. The cutaneous and deep veins were found thrombosed throughout, and there was an embolus at the bifurcation of the popliteal artery, above which the artery was also thrombosed. The patient was in poor condition at the end of the operation. The next day the pulse was irregular. The night of March 19 she was delirious. She complained of severe pain in the right leg. Next day the right foot and leg were mottled and purple to the knee. No pulse was felt in the tibials or popliteal.

March 22 the right leg was amputated at the junction of the lower and middle thirds. There was very little bleeding. The femoral vessels were plugged by thrombi. Pathological examination showed an area of commencing gangrene on the outer side of the foot. The entire leg as high as the knee was slightly yellowish. Dissection showed the veins everywhere thrombosed and in the popliteal artery at its bifurcation a grayish, more or less discolored thrombus. Below the arteries contained but little blood, while above they were filled with clots, and several thrombi were adherent to the walls. The patient was in better general condition after this operation than after the first.

March 30 she had an attack of pain and discomfort in the epigastrium and tingling and numbness in the right arm. The arm and hand became cold and white. The pulse was present in the subclavian artery but not in the brachial. April 1 there was a suggestion of pulse in the right wrist, and the hand was warm. April 4 there was a feeble right radial. The wounds were clean and solid. She felt very well. April 16 there was a flicker of pulse in the right brachial and the radial.

April 17 she had right hemiplegia. April 18 she died.

Discussion

BY DR. MAURICE FREMONT-SMITH

NOTES ON THE HISTORY

There seems to be little doubt that this woman had had an embolus either riding over the common iliacs and then going into the left iliac and femoral, or a double embolus striking both legs at the same time. The sudden onset of pain, numbness, and afterwards discoloration show that the blood was suddenly cut off from the limb. One often gets a paralysis of an extremity following an embolus, the paralysis later clearing up. The foot and leg look white and mottled at first, later on grow bluish and marble-like. With an arterial embolus there is little actual edema. Later on if collateral circulation be not reëstablished the extremity becomes gangrenous, as in this case.

NOTES ON THE PHYSICAL EXAMINATION

The interesting question here is the source of the embolus. We have the note that the vessels in the calf are blue and cord-like. It is probable that this is a secondary thrombosis of the veins. It must not be forgotten however that it is possible to have an embolus starting in a vein, traveling up to the heart, passing through an open foramen ovale, which I believe occurs rather frequently, in something like twenty-five to thirty per cent. of the necropsies, and thereupon traveling down into the arterial system.

Of course with the cardiac picture here it is far more probable that we have an enlarged heart, possibly on a rheumatic basis the history of which we have not heard; if so, with a mitral stenosis, auricular fibrillation and a thrombus in the auricular appendage.

Of course this is a very small dosage of digitalis as we look at it today.

On March 19 either she had another embolus or the one on the right side had at first only partially occluded the artery and a thrombus had formed about it.

On March 30 she had another embolus.

DIFFERENTIAL DIAGNOSIS

When foreign particles are introduced into the aorta it has been found that they plug first the vessels of the extremities and that the kidneys, liver and brain escape until later. This experimental evidence is borne out by this case. It is interesting to note the extreme amount of thrombosis of the veins. I should not have expected, without some disease of the veins themselves, to have seen as much thrombosis as is evidenced here. I think however we have to go to the heart for the probable source of these emboli. Whether we shall find simply a dilated auricle filled with clot or massive vegetations on the aortic valve I think we have no evidence to show.

Dr. Bock: I should be interested to know at about what time the patient was in the hospital, on account of the therapy.

Dr. Fremont-Smith: Twenty-two years ago. I suppose Dr. Bock was thinking of possible surgical intervention.

Dr. Bock: No, I was thinking of the ten minims of digitalis.

Dr. Fremont-Smith: It seemed to work!

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Embolic gangrene of leg.

DR. FREMONT-SMITH'S DIAGNOSIS

Embolism and thrombosis.
Chronic endocarditis (mitral stenosis?)
Hypertrophy and dilatation of the heart.

ANATOMICAL DIAGNOSIS

1. *Primary fatal lesions*

Chronic endocarditis (mitral stenosis).

2. *Secondary or terminal lesions*

Hypertrophy and dilatation of the left auricle.
Streptococcus infection.
Thrombosis of the left auricular appendix.
Embolic thrombosis of the right axillary artery.
Hemorrhages into basal ganglia on left side.
Multiple infarcts of spleen and kidneys.
Double amputation at lower third of the thighs for embolic gangrene.
Obliterating thrombosis of left common iliac and external iliac veins.
Infarcts in left lung.
Ulcer of duodenum.
Hemorrhage into small intestine.

3. *Historical landmarks*

Malformation of left common iliac vein.
Chronic perihepatitis.
Cholelithiasis.

Dr. Fremont-Smith: Was that a hemorrhage into the basal ganglia? It was not a hemorrhagic infarct?

Dr. Richardson: I should think from the description that those were of the nature of infarcts, because the cerebral vessels were not remarkable.

A Physician: Was there any evidence of bacterial endocarditis on that mitral?

Dr. Fremont-Smith: The temperature never went above 100°.

Dr. Richardson: No, there was not.

Dr. Cabot: Was this mitral stenosis pathologically like any other mitral stenosis?

Dr. Richardson: Yes.

Dr. Cabot: I am interested in this case because it is a type of mitral stenosis that does not

get adequate mention in the literature. We have quite a group of cases of mitral stenosis in our necropsies in which the first thing that anybody knows is gangrene. The very first event is not congestion or anything suggesting the heart at all. It is peripheral gangrene.

I have been interested in the different methods of death in mitral stenosis. The largest group of cases die of passive congestion, the second largest is that in which there is acute endocarditis on top of the old and they die of sepsis essentially, and then we have this third group in which the embolic death is really the point.

DR. BOCK: There is another group of which we had three examples in one year, of extreme mitral stenosis in patients between twenty and thirty years of age, with no cardiac symptoms until the sudden onset of pulmonary edema followed by death.

DR. CABOT: Would you call that passive congestion, only very sudden?

DR. BOCK: I should hesitate to call an acute pulmonary edema which comes on very suddenly passive congestion.

DR. CABOT: How many years ago were those cases?

DR. BOCK: One or two. There were three cases. I think we had two and Dr. Magrath had one. I saw all three. Dr. Magrath said that that was an event that he had seen before occurring in uncomplicated mitral stenosis in young people.

CASE 11133

SURGICAL DEPARTMENT

A Nova Scotian housewife of forty-nine entered April 25. She remembered no serious illnesses or injuries. She passed the menopause six years before admission. Three weeks and a half before admission while working in a factory her hair was caught in some machinery and her scalp torn almost completely off. Twenty minutes after the injury she was taken to a hospital where the wound was dressed without ether. The pain had increased somewhat but had not been unendurable.

Examination was negative except for obesity and the injured area, which was covered with healthy looking granulation tissue with fresh epithelium growing in about its edge. There was no pus and not even a red angry look. The heart was not enlarged. The action was regular, the sounds clear and of good quality. No murmurs were heard. The pulses were of fair volume and tension.

The patient slept fairly well and complained of nothing. April 30 a Tiersch skin graft was done under spinal anesthesia, skin being taken from the thighs. The patient stood the operation well and returned to the ward in good condition. Except that some of the grafts at the back of the head floated off with pus she seemed to be doing very well until May 7, when she suddenly became very cyanotic, with extreme air hunger and thready pulse. She failed to respond to stimulation or artificial respiration and died that day.

DISCUSSION

BY DR. EDWARD D. CHURCHILL

This is a very characteristic injury, avulsion of the scalp, particularly apt to take place in women employed in factories, as their long hair is apt to become entangled in the moving belts and pulleys. The layers of the scalp are the skin, the subcutaneous tissue, the epicranial aponeurosis, a layer of loose areolar tissue, and the pericranium. It is between the pericranium and the epicranium that the separation takes place. Occasionally the pericranium is also torn, causing necrosis of the bone of the skull.

She came here three weeks after the injury.

The restoration of epithelium in such a large denuded area is a very difficult problem. Particularly is this so in the scalp, where the blood supply is largely destroyed by the injury. There are several surgical procedures which may be tried. The first operation is usually to apply skin-grafts in the form of either Reverdin or Thiersch grafts. The poor blood supply may make it impossible to obtain a good growth of epithelium merely from planting the skin grafts. To correct the chronic ulceration from malnutrition of the new skin we must in some way increase the blood supply in the center of the area. That has been accomplished in certain cases by drilling through the outer table of the skull to the diploë, allowing new vessels to grow up to give additional blood supply. The scar contraction around the edges then cannot subsequently shut off the blood vessels going to the vertex. At times holes have been bored entirely through the skull to the dura hoping that new blood vessels would grow up from the dura. In this case they are apparently going to try to reduce the area before going ahead with any of these more radical procedures, which indeed may not be necessary.

In regard to the grafts floating off into pus, it is not unusual to lose a certain percentage of the area of the skin which we place on a septic granulating surface.

I think it is fair to say that she did not die from the wound. There was some further complication, and of course this description of events is the picture of pulmonary embolism. Embolism of the pulmonary artery occurs, as we know, following any surgical wound, particularly one which is attended with the trauma to the veins undoubtedly accompanying this injury.

As to other conditions which might cause such sudden death, we speak of sudden heart failure. I do not know what that is in a surgical patient of this type. There are conditions of massive

atelectasis or massive collapse of the lung coming on suddenly which may cause sudden death, but we know very little about them. I should feel perfectly satisfied with a diagnosis of embolism of the pulmonary artery.

DR. CABOT: Do you know how fatal these avulsions of the scalp are ordinarily?

DR. CHURCHILL: I do not think that the condition has a high mortality. If this patient had not had this complication I do not think she would have died. I think it would have been a long time—two or three years—before she was completely healed.

DR. CABOT: It is a tedious thing but not a dangerous thing.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Avulsion of scalp.
Pulmonary thrombosis.

DR. EDWARD D. CHURCHILL'S DIAGNOSIS

Avulsion of the scalp.
Embolism of the pulmonary artery.

ANATOMICAL DIAGNOSIS

Absence of the scalp (avulsion) with granulation tissue formation and skin graft.
Embolism of the right auricle and the pulmonary arteries, right and left.
Thrombosis of the posterior tibial veins, left and right.
Perforate interventricular septum.
Open foramen ovale.
Fatty metamorphosis of the liver.
Fibromyoma of the uterus.

EXTRACTS FROM THE MEDICAL EXAMINER'S RECORD*

The heart weighs 314 grams. The epicardium contains abundant fat. On section the cavities of the left side are empty. Myocardium brownish red and limp. Wall of left ventricle 1.4, of right 0.4 cm. in thickness. Mitral valve 9.8, aortic valve 8, pulmonary valve 8, tricuspid valve 10.5 cm. in circumference. Depth of left ventricle 9.3 cm. The aortic curtain of the mitral valve contains several small smooth yellowish patches; the endocardium and valve curtains otherwise normal. The interventricular septum at a point 3 cm. below the anterior curtain of the aortic valve shows an oval depression about 1 cm. across, at the bottom of which is an opening 0.2 cm. across. A probe introduced into this passes obliquely downward and to the right, emerging in the cavity of the left ventricle at a point 5 cm. above the apex. The coronary arteries contain small soft yellowish patches. At the site of the foramen ovale, along the anterior border of the membrane, is a slit-like opening about 1 cm. long, well guarded.

*Furnished through the courtesy of George Burgess Magrath, M.D., Medical Examiner for Suffolk County, Massachusetts.

DR. RICHARDSON: This case was examined by the Medical Examiner, and we have the anatomical diagnosis and a note through the courtesy of Dr. Magrath.

There was a thrombosis of the posterior tibial veins, left and right. That of course is the important statement, because that is the probable source for the pulmonary embolism which was present.

DR. CABOT: How much did the congenital heart lesion enter in? Do you think it is of any importance?

DR. RICHARDSON: Not as a cause for death.

DR. CABOT: She would have got along all right with that?

DR. RICHARDSON: Yes. It is not a thing we like to have in a heart, but we should not expect death to result from it. It was an additional load, but the death here was due to frank pulmonary embolism, and the only source we have for it is in the thrombosis of the posterior tibial veins.

DR. CHURCHILL: It would look as though the skin-grafting might have been the cause of death rather than the avulsion. They took the skin from the thighs according to the record.

DR. CABOT: Why should that bring about a thrombosis in the leg veins?

DR. CHURCHILL: There is no reason whatsoever. There is no mention made of sepsis, and the wounds of a skin-graft are really intradermal.

DR. RICHARDSON: Except as mention of the vein is made. The thrombosis is due to something.

DR. CABOT: It is hard to see how a skin-graft in the thigh could do that.

DR. RICHARDSON: Unless there was some infection. There certainly was infection higher up.

DR. CHURCHILL: Is it possible that in a patient with a congenital heart lesion there exists some mechanical situation which would favor thrombosis?

DR. CABOT: I do not know any reason to think so.

RELATIVE MORTALITY OF HEART DISEASE AND TUBERCULOSIS

"A CHILD at ten years of age is, under present conditions, three times as likely to die eventually from heart disease as from tuberculosis. This disparity between the chances of death from heart disease and from tuberculosis increases with advancing age—more rapidly for females than for males.

"At age thirty-five, the probability of dying eventually from heart disease among males is nearly four times that for tuberculosis; among females, the chance of death from heart disease is almost six times that for tuberculosis."—*Statistical Bulletin, Metropolitan Life Insurance Company.*

CURRENT LITERATURE

ABSTRACTORS

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VAN DEN BERGH'S TEST IN JAUNDICE

ANDREWES (*Quar. Jour. of Med.*, Oct., 1924) publishes observations on 184 cases. Bilirubin reacts with Ehrlich's diazo-reagent, giving a red color. This is made use of by Van den Bergh as a qualitative and quantitative test for bilirubin in the blood serum. Two types of reaction are met with: the "direct," in which the color appears at once, and the "indirect," in which the color develops gradually or not at all in aqueous solution, but a pinkish violet color appears promptly in alcoholic solution. These two types of reaction, according to Van den Bergh, represent two different forms of bilirubin in the blood; that giving the direct reaction is due to the form met with in normal bile, and in the blood in obstructive jaundice, while the indirect reaction is given by the form present in normal blood serum and in hemolytic jaundice. The quantitative test is made by a colorimetric method.

The investigations of Andrewes confirm in the main Van den Bergh's contentions. In all cases of obstructive jaundice the direct reaction was given by the serum, and in all cases of hemolytic jaundice the indirect reaction alone was present. Pernicious anemia always showed an increase of the bilirubin of the indirect variety, even in cases not showing urobilinuria, while secondary anemia always gave a normal figure. Catarrhal jaundice always gave a direct reaction, so that the test is of no value to distinguish between this condition and diseases of the gall-bladder. Cases of heart disease with congestive failure usually showed a latent if not an obvious jaundice, giving sometimes a direct, sometimes an indirect reaction. Toxic jaundice (chloroform, arsphenamin) gave the direct reaction, as did most cases in which liver-cell damage could be assumed. In new-born infants an increase of the bilirubin was always found, whether jaundice developed later or not; it gave always the indirect reaction, pointing to the probable hemolytic nature of this form of icterus. Hemorrhagic effusions and hematomas showed a considerable amount of bilirubin giving the indirect reaction; the test is thus of value to distinguish these conditions from accidental admixture of blood as the result of the puncture.

The author confirmed Van den Bergh's statement that the threshold for the excretion of bilirubin of the form giving the direct reaction is four units, while no case showing the indirect reaction excreted bilirubin in the urine, no matter how high the amount in the blood.

To sum up, the test is of great practical value in detecting latent jaundice, i. e., an increase in the bilirubin of the serum which is not sufficient to produce a yellow color in the skin, and in following the progress of a case. It will not distinguish between jaundice due to liver cell damage and that due to obstruction of the bile passages. In pernicious anemia and hemolytic jaundice it is a useful confirmatory test, though the diagnosis is usually readily made by other methods. It will show whether a yellow color of the skin is due to jaundice or not. (The writer observed two cases of yellowness in diabetes in which the bilirubin was not increased and the color was probably due to carotin from carrots in the diet.)

[W. T.]

TREATMENT OF GONORRHEA WITH ACRIFLAVINE

JACOB and VERASINGAM (*Ind. Med. Gaz.*, Feb., 1924) report 30 cases of gonorrhea treated by intravenous injections of acriflavine. A 1:500 solution of the drug in normal saline was used. All injections were given on a fasting stomach, with 24 hours' rest in bed subsequently. Five doses were given as follows: First dose, 100 c.c.; second dose, 150 c.c. two days later; third dose, 200 c.c. three days later; fourth dose, 200 c.c. four days later; fifth dose, 200 c.c. four days later. None of the usual urinary antiseptics were given. Cases with anterior urethritis only received no irrigations, those with posterior urethritis received daily irrigations of permanganate of potash, also prostatic massage. Conditions required before a case was discharged as cured were as follows: (1) the discharge must have ceased completely; (2) examination of the prostatic discharge after massage must be negative for gonococci; (3) the complement fixation test must be negative. On this basis the results in the 30 cases were as follows: Cured, 26; relieved, 3; no improvement, 1. No untoward symptoms were observed in any of the patients from the injections.

[L. D. C.]

DETERIORATION OF INSULIN

TAYLOR and DOUGLAS (*Ind. Med. Gaz.*, Jan., 1924) issue a warning on the use of insulin which may have deteriorated in potency. They used insulin manufactured in the United States and shipped to India by a responsible firm, and were puzzled by their poor results. They therefore submitted the preparation to animal tests. In one rabbit 25 times what should have been a convulsant dose failed to produce any symptoms and the effect on the blood sugar was negligible. In another rabbit 100 units produced no symptoms. In other words, this insulin was less than one-fiftieth of its original potency and of no value for treatment. Another lot of insulin obtained from a different source was tested and found similarly impotent. It is obviously of great importance that the conditions of import and storage necessary to maintain potency should be determined. The main points to study are the duration of potency and the effect of cold storage.

[L. D. C.]

VITEX PEDUNCULARIS IN MALARIA

CHOPRA and KNOWLES (*Ind. Med. Gaz.*, March, 1924) report on a clinical study of the pharmacological action of Vitex peduncularis in 12 cases of malaria. Aboriginal tribes in India are well acquainted with this plant and have used it with benefit in the treatment of blackwater and malarial fevers. Vaughn has reported satisfactory results with an infusion prepared by the method used by the natives.

The writers, after a thorough clinical trial, conclude as follows:

1. Chemical analysis of the dried leaves of Vitex peduncularis shows the presence of traces of an alkaloid.

2. In our series of cases of malarial fever caused by P. vivax, P. malariae and L. malariae, the freshly prepared infusion of dried leaves had no effect whatever on the parasites in the blood, the temperature chart or the clinical symptoms.

3. The drug appears to be absolutely useless in the treatment of malaria.

[L. D. C.]

Observations on the Course of 413 Cases of Untreated or Inadequately Treated Syphilis

Stokes, J. H., and DesBrisay, H. A. (*Am. Jour. of Syph.*, Vol. 8:558, July, 1924), have examined the histories of a little over 400 cases of syphilis untreated or inadequately treated and find that the results are definitely better in inadequately treated than in untreated cases, thus all cases of this disease should be treated. They find a spontaneous tendency to Wassermann negativity in untreated syphilis with lapse of time in human beings, which amounts to 30 per cent. in the work of an ordinary diagnostic practice. Wassermann negativity in the blood seems to be particularly an attribute of neurosyphilis. There is an age duration gradient in the spontaneously progressing case which leads to ultimate complete serologic negativity in both the blood and fluid in time. This serologic negativity is not necessarily synonymous with symptomatic arrest. Seven and a half per cent. of 225 cases were symptomatically progressive in the face of complete serologic negativity. Spontaneous arrest, symptomatic and serologic, occurred in less than 1 per cent. of 208 untreated cases. Following treatment by mouth, 6 per cent. were totally arrested and 10 per cent. were serologically negative on blood and fluid. Cutaneous and osseous syphilis appear to protect against, or are mutually exclusive of, neurosyphilis. There is evidence that time is an essential element in the defence mechanism which acts to retard rather than prevent late or grave complications.

They do not find that inadequate treatment increases the danger of neurosyphilis. Cases treated by modern methods, even though inadequate, exhibit a definitely lower proportion of cardiovascular, visceral, osseous, cutaneous and mucosal complications than untreated or mouth treated cases. In the young who have been recently infected the modern form of treatment is much preferable to the less intensive, while old infections should be treated mildly and syptomatically. They quote Warthin's fine statement of his views regarding the resistance and mechanism of syphilis, which is, in the main: latency, the prolonged asymptomatic periods, and the seemingly benign course of syphilis through many years is purchased at a price. The immunity of the patient is maintained by the slow inflammatory reaction of tissues in immediate contact with the organisms. This chronic, slow immunity is, paradoxically speaking, his undoing. The fibrosis and replacement of vital parenchymatous tissue following on this defense reaction is the foundation of the gravest degenerative changes of the disease.

[A. W. C.]

Duodenal Lavages in the Treatment of Jaundice Complicating the Treatment of Syphilis

Wilhelm, L. F. X. (*Arch. of Derm. and Syph.*, 10:499, Oct., 1924), summarizes as follows: 33 patients were treated by duodenal lavage, 30 (90 per cent.) of whom recovered definitely and rapidly following this procedure. A maximum of eight lavages, and an average of two, was necessary for relief. The average duration of toxic manifestations was from 10 to 12 days.

Duodenal lavage is a valuable adjunct in the treatment of jaundice from toxic or infectious cholangitis complicating treatment for syphilis; it controls the nausea and vomiting, restores the appetite, relieves the abdominal pain and clears up the toxic mental state. Only the most severe cases of jaundice of this type fail to respond in some degree to duodenal lavage.

After a successful duodenal lavage in cases of infectious cholangitis, treatment for syphilis may be cautiously resumed. Lavage should be repeated on alternate days until bile is obtained, and should be continued until the patient's symptoms are entirely relieved. The cases cited tend to show that arsenic is not necessarily the etiologic agent that produces this type of jaundice.

[A. W. C.]

Technic for an Accurate Performance of the Differential Kidney Function with Phenolsulphonephthalein

Randall Alexander (*Jour. of Urology*, October, 1924).

The author's technique consists of the routine use of a large (11F) Garceau catheter in one ureter, the secretion from the opposite kidney being collected either per cystoscope or by immediate catheterization of the bladder at the termination of the test. The side to catheterize is preferably the one supposed to be free from disease or the better of the two kidneys when bilateral disease exists, or in the ureter of the one on which surgery is not contemplated. The reasons for this choice are: (a) It is of great consequence to know accurately before operating not only the extent or location of disease, but the functional value of the kidney that is to be left to carry on the body's work. (b) Any leakage that may possibly occur errs on the side of safety and is in favor of the diseased organ. (c) There is no disturbance of the diseased organ; it is left to perform its best work as it is.

[B. D. W.]

The Formol-Gel Test in Kala-Agar

Elwes, Menon and Ramakrishman (*Ind. Med. Gaz.*, Apr., 1924) tested the formol-gel (aldehyde) test as a means of diagnosis in 100 cases of kala-agar. Nineteen proved cases (Leishman-Donovan bodies in smears from liver puncture) entirely failed to give positive formol-gel reactions. In 10 other proved cases this test was doubtful. Several cases of clinical kala-agar gave positive formol-gel tests, but liver puncture failed to reveal Leishman-Donovan bodies. In three cases which proved not to be kala-agar (one tuberculosis, one leukaemia, one malaria) the formol-gel test was positive.

Taking the series as a whole, 23.4 per cent. of the proved cases gave a completely negative test, and in 12.3 per cent. of the proved cases the reaction was doubtful. Thus in 35.7 per cent. of the proved cases of kala-agar the formol-gel test was of little or no value.

[L. D. C.]

Notes on Smallpox and Garlic

To the December issue, 1924, of *Annals of Medical History*, Cumston of Geneva contributes interesting historical notes on smallpox and inoculation, and to the September issue a piece of correspondence on a rare lay medical tract of the seventeenth century. This tract is known as "The Duke's Desk, by William Lovell, Gentleman and Traveller. London. 1660." It contains many "rare receipts of physick and surgery," notably one emphasizing the therapeutic value of garlic as a hypotensive and antispasmodic.

[R. M. G.]

Treatment of Common Warts by Neoarsphenamin

Lindsay, H. C. L. (*Arch. of Derm. and Syph.*, 10: 476, Oct., 1924), reports a case of multiple warts successfully treated with two injections of neoarsphenamin intravenously, the explanation apparently being that in this way more arsenic can safely be given than in other forms, such as Fowler's solution.

[A. W. C.]

Melanoma of the Nail Bed

Jones, T. B. (*Annals of Surgery*, Dec., 1924).

Jones reports in detail three cases of this rather unusual condition and draws the following conclusions:

1. Melanoma of the nail bed may occur.
2. The condition resembles paronchyia, but is chronic and shows pigmentation.
3. Occasional cases may occur without obvious pigmentation.
4. The diagnosis is ordinarily made late with the result that treatment is hopeless.
5. This condition must be considered in all chronic conditions of the nail bed.
6. Diagnosis should be confirmed by excision and microscopic examination of tissue, followed by immediate operation.
7. In the three cases reported, the diagnosis was made too late to prevent death from general metastases.

[E. H. R.]

The Kottmann Reaction

Theophile Raphael and George J. Smith (*American Journal of Psychiatry*, Oct., 1924) tested 754 sera from 291 psychiatric patients of various types, 20 normal controls and 8 medically frank hyperthyroid cases, using the Kottmann reaction, based upon the protective property of human blood serum towards colloidal iodine. Their results coincide with those previously reported by both Kottmann and by Petersen (*Arch. Int. Med.*, Sept., 1922). The test was of little value in differential diagnosis, but proved to be positive in practically all patients showing psychic stress or tension.

[H. R. V.]

Boston Psychopathic Hospital

W. Franklin Wood (*Am. Jour. of Psychiatry*, Oct., 1924) outlines the function of the hospital from the point of view of the executive officer. He points out that the three main lines of work are, first, the care and treatment of all forms of mental disease; second, clinical instruction to physicians, medical students, nurses, social workers, and laymen, and third, research work. This hospital, with only 110 beds, admits more than 2,000 cases a year.

[H. R. V.]

Haematuria

Walker, J. T. (*Canad. Med. Jour.*, 14:909, October, 1924), discusses the subject of haematuria and offers the following advice. Haematuria is a symptom, not a disease, and the cessation of the haematuria is not a cure of a disease. Every case of haematuria should be followed to a definite diagnosis, using if necessary all the resources of modern surgery. Cases of haematuria should be submitted to cystoscopy during an attack of haematuria so that if the haematuria has a renal source the side from which it comes may be discovered.

[A. W. C.]

Bone Tumors. Myxoma

Bloodgood, J. C. (*Annals of Surgery*, Dec., 1924).

This is the second paper, with a report of three new cases. Bloodgood presents his characteristically thoroughly detailed article on this subject and gives the case histories, operation, and results in three cases. These are too detailed for reporting in abstract, but have an important bearing on this subject.

[E. H. R.]

Infective Endocarditis in Congenital Heart Disease

Boldero, H. E. A. and Bedford, D. E. (*The Lancet*, Oct. 11, 1924) are of the opinion that local thickening of the endocardium and increased local strain are factors in determining the onset of the infective process in congenital heart disease, but suggest that the access of arterial blood to the right heart may explain the unusual frequency of dextral endocarditis in these cases. They are of the opinion that the preponderance of left-sided lesions in endocarditis in general cannot be adequately explained by the higher blood pressure in the systematic circulation, and are impressed with the possibility that it may be due to the changed composition of the blood after passing through the lungs.

[R. C.]

Treatment of Facial Paralysis

Fuchs and Pfeffer (*Wien. Klin. Woch.*, Oct. 2, 1924) describe a new apparatus for the treatment of central and peripheral facial paralysis. The object of this apparatus in unilateral paralysis is to compel the soft parts of the affected side to perform passively the same movements that are performed voluntarily by the well side, thereby avoiding muscular atrophy and encouraging the recovery of spontaneous normal function.

[R. M. G.]

The Use of Insulin in Operations on the Diabetic

Pemberton, H. S. (*The Lancet*, Sept. 27, 1924) states that ether anaesthesia in the diabetic produces a more severe hyperglycaemia and a greater fall in the alkali reserve than in a non-diabetic. They may be controlled by the pre-, intra-, and post-operative use of insulin. In spite of the administration of insulin the post-operative complication of sepsis appears to maintain both hyperglycaemia and a low alkali reserve; the latter may be restored by alkali therapy.

[R. C.]

Treatment of Breech Presentation

Katz, from von Peham's clinic at Vienna, discusses the indications for bringing down a foot as a prophylactic in the treatment of breech presentations. He believes this is indicated in all cases in which the delivery promises to offer exceptional difficulties.

[R. M. G.]

Physiologic Bilirubinaemia of Pregnancy

Under the above title, Herrmann and Kornfeld, from Kermauner's Clinic at Vienna, describe (*Wien. Klin. Woch.*, Nov. 20, 1924) a condition which they have found normal in from thirty to sixty per cent. of pregnant patients. Apparently this increase of bilirubin in the blood is more frequent in the early months of pregnancy, but is without clinical significance.

[R. M. G.]

Astragalectomy (The Whitman Operation) in Paralytic Deformities of the Foot

MacAusland, W. R., and MacAusland, A. R. (*Ann. of Surg.*, Dec., 1924).

These authors present a very well and profusely illustrated article describing the details of their operation for this condition. They report a series of cases and speak favorably of the results from this procedure.

[E. H. R.]

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CELIAC DISEASE

One of the most interesting and baffling of the chronic digestive disturbances of infancy is so-called celiac disease, far better designated as chronic intestinal indigestion. The latter name should rightly displace all other more or less current ones, of which there are a number, such as chronic digestive insufficiency, intestinal infantilism, chronic fat indigestion, fat intolerance, celiac infantilism, Herter's infantilism, acholia, pancreatic infantilism and pancreatic insufficiency. When a disease calls forth such a varied nomenclature its origin is generally obscure.

One of the best clinical descriptions of the disease is the original one published by S. Gee in St. Bartholomew's Hospital Reports in 1888:

"There is a kind of chronic indigestion which is met with in persons of all ages, yet is especially apt to affect children between one and five years old. Signs of the disease are yielded by the faeces; being loose, not formed but not watery; more bulky than the food taken would seem to account for; pale in colour, as if devoid of bile; yeasty, frothy, an appearance probably due to fermentation; stinking, stench often very great, the food having undergone putrefaction rather than concoction. The pale loose stool looks very much like oatmeal porridge or gruel. The hue is somewhile more yellow, otherwhile more drab."

"The patient wastes more in the limbs than in the face, which often remains plump until death is nigh. In the limbs, emaciation is at first more apparent to hand than to eye, the flesh feeling soft and flabby."

"To diarrhoea alba add emaciation and cachexia, and we have a complete picture of the disease."

Distension of the abdomen has always been noted as a marked feature of the disease; the fat content of the stool is large; nervous symptoms with irritability and fatigability predominate, and the patient may be subject to tetany, rickets, fainting attacks, stupor and convulsions.

The cause may be idiopathic or may be due to overlarge amounts of improperly cooked starches causing an intolerance to these foods which is soon followed by an intolerance to fats. Inability to digest sweet cow's milk is a striking feature and this factor, in conjunction with the intolerance to carbohydrate and fats, has led to the generally accepted protein feeding. Regardless of treatment the disease is essentially chronic with relapses even when recovery seems assured. The course of treatment is always a matter of years rather than months.

W. McKim Marriott (*Abt's Pediatrics*, Vol. III, p. 386) recommends an initial feeding of skimmed lactic acid milk with added calcium caseinate, and later with the addition of Karo corn syrup, for this sugar seems to be strikingly well borne.

Some of the German clinics have used dead ripe and therefore completely dextrinized bananas, and this form of treatment has met with considerable success in this country. Certainly some form of carbohydrate should be added to the diet as soon as possible, and a few sugars seem to meet the proper requirements.

Rood Taylor (*Am. J. Dis. Child*, 25:48, Jan., 1923) notes the usual set of symptoms with diminished metabolism, increased calcium output and diminished free hydrochloric acid in the gastric juice. He believes that extensive liver disease is present. Taylor's treatment consists in corn syrup and orange juice and later fat-free lactic acid milk with added curd.

Louis W. Sauer, in a recent communication, (*Am. J. Dis. Child.*, 29: 155, Feb., 1925) recommends a three-phased high protein diet, based largely on powdered protein milk. During the second phase it is supplemented with almost pure protein foods such as curds of buttermilk, scraped lean beef, tongue and eggs. During the third phase carbohydrates, at first dextrinized flours, are cautiously added.

Two other conditions must not be confused with chronic intestinal indigestion. Hirschsprung's disease, or megacolon, has a more greatly enlarged colon, more pronounced constipation, and occurs at an earlier age. Tuber-

culous peritonitis is associated with a more rapid onset, abdominal tumor, and often free abdominal fluid. Other clinical or laboratory signs of tuberculosis are generally present.

RAT-BITE FEVER

RAT-BITE fever constitutes a definite clinical entity which, while comparatively rare in this country, is nevertheless of frequent enough occurrence to deserve special mention, for an opportunity to make the diagnosis may occasionally come to any practitioner. The first description of the disease in the United States was made by Wilcox in 1840 (Wilcox, W.: *Am. J. M. Sc.* 26:245, 1840), and since that time cases have been reported at intervals. Although most of the cases have occurred in adults it may fall to the lot of the pediatrician to recognize the condition, for the diagnosis was recently made in an infant at the Boston City Hospital, and Dembo et al have just reported a case in an infant aged 7 months in the *American Journal of Diseases of Children* (29:182, February, 1925).

Dembo and his associates define rat-bite fever as an infectious disease caused usually by the bite of a rat, and characterized by paroxysms of fever, an inflammatory reaction at the site of the wound, enlargement and tenderness of the adjacent lymph glands, and a skin eruption. Less commonly the condition may follow the bite of a ferret, cat, dog or squirrel.

Rat-bite fever is much more common in Japan than in North America or Europe, and it is to the Japanese that we owe the discovery of the causative organism, *Spirochaeta morsus-muris.* Observers in various countries have since found the spirochaeta in the blood by the dark field method, and this is now the practical diagnostic method.

The pathological changes found in the disease have included ulcerative endocarditis, passive congestion of the lung and liver, splenic infarcts, infiltration of the heart muscle and glomerular and interstitial nephritis. Various clinical types have been mentioned, Miyake dividing the disease into three: (1) the febrile form; (2) the afebrile forms with predominating nervous symptoms, and (3) the abortive form. The average period of incubation is two weeks. There are no prodromal symptoms.

The disease generally manifests itself by local and systemic reactions. The healed bite area becomes painful, swollen and of a red-blue color, with tender enlargement of the adjacent lymph glands. Coincident with this are fever, chills, muscle pains and tenderness, asthenia, headache and joint pains. The fever is high for several days and terminates by crisis rather than lysis. Following remissions of several days come further paroxysms. During the first few paroxysms the rash, consisting of bluish-red macules from 1 to 9 mm. in diameter, appears. Leukocytosis is a prominent feature and the blood Wassermann may be positive. A secondary anemia progresses with the disease. A mild or severe toxic nephritis may occur, and is the principal complication. Ordinarily the prognosis in uncomplicated cases is good, the mortality having been placed at 10 per cent. Intravenous arsenic is a specific form of treatment, prophylaxis consisting in the immediate cauterization of the bite.

MISCELLANY

THE VIRULENCE OF SMALLPOX

As evidence of the increasing virulence of smallpox, Minnesota reports that the deaths from January 26th, 1924, to February 1st, 1925, were almost double those for the 20-year period, 1903 to 1923. This is but one item in the great mass of evidence that smallpox is becoming more virulent and that the need for vaccination is growing greater. Translated into rational action this situation means vaccinate.—*Connecticul Health Bulletin.*

MATERNITY AND INFANCY, VERMONT

THE Vermont legislature voted during the last week in February to accept the provisions of the Federal Maternity and Infancy Act, bringing the total number of States coöperating with the National Government under this Act up to 42.

THE JOINT INFORMATION BUREAU IN MOSCOW AND THE RUSSIAN INFORMATION BUREAU

THE lack of continuous contact between scientists, scientific institutions and cultural organizations of the United States and the Union of Soviet Republics has been felt for many years in both countries.

Since the war there has been practically no mutual exchange of scientific publications—with the result that the institutions and organizations concerned were unable to form any comprehensive idea of the mutual activities and achievements.

The Joint Information Bureau has been created in Moscow with the aim of assisting in the establishment of closer cultural connections between the Union of Soviet Republics and other countries.

This is in constant communication with most of the scientific and cultural establishments and institutions of the Soviet Union and is in a position to facilitate regular contact as well as an exchange of scientific periodical and non-periodical publications between the interested institutions, groups and individuals of the Soviet union and the other countries. Personal exchange of their works between scientists engaged in similar research activities

could also be arranged as well as the publication of unpublished manuscripts and articles in the general periodical and special press.

At the request of the Joint Information Bureau in Moscow the Russian Information Bureau in Washington has undertaken to represent the Moscow Bureau in its endeavors which will no doubt be in the mutual interest of both countries.

The interested institutions, organizations and individuals may apply to the Russian Information Bureau in Washington, D. C.—*Russian Information Bureau,* 2819 Connecticut Avenue, N. W., Washington, D. C.

UNITED STATES CIVIL SERVICE EXAMINATION

The United States Civil Service Commission announces the following open competitive examination:

JUNIOR MEDICAL OFFICER
ASSISTANT MEDICAL OFFICER
ASSOCIATE MEDICAL OFFICER
MEDICAL OFFICER
SENIOR MEDICAL OFFICER

Receipt of applications for these examinations will close on June 30, 1925. They are to fill vacancies in various branches of the Government service.

The entrance salaries range from $1860 a year for junior medical officer to $5200 a year for senior medical officer. Higher-salaried positions are filled through promotion where practicable.

Full information and application blanks may be obtained from the United States Civil Service Commission, Washington, D. C., or the secretary of the Board of United States Civil Service Examiners at the postoffice or custom house in any city.

NOTICE OF EXAMINATION FOR ENTRANCE INTO THE REGULAR CORPS OF THE UNITED STATES PUBLIC HEALTH SERVICE

Examinations of Candidates for entrance into the Regular Corps of the United States Public Health Service will be held at the following-named places on the dates specified:

At Washington, D. C.	June 1, 1925
At Chicago, Ill.	June 1, 1925
At New Orleans, La.	June 1, 1925
At San Francisco, Cal.	June 1, 1925

Candidates must be not less than 23 nor more than 32 years of age, and they must have been graduated in medicine at some reputable medical college, and have had one year's hospital experience or two years' professional practice. They must pass satisfactorily oral, written and clinical tests before a board of medical officers and undergo a physical examination.

Requests for information or permission to take this examination should be addressed to the Surgeon-General, United States Public Health Service, Washington, D. C.

H. S. CUMMING, *Surgeon-General.*

SCHOLARSHIPS AWARDED AT HARVARD MEDICAL SCHOOL AT A MEETING OF THE PRESIDENT AND FELLOWS OF HARVARD COLLEGE IN BOSTON, MARCH 9, 1925

VOTED, on recommendation of the Administrative Board of the Medical School, to award the following scholarships for 1924-25:

Rodger, F. R. Parks; Lewis and Harriet Hayden, J. C. Whitaker; Lewis and Harriet Hayden, F. R. Allen; Anna G. Walker, G. W. Ballantyne; James Ewing Mears, W. E. Davis; Gordon Bartlett, I. M. Dixson; David Williams Cheever, V. Menkin; George Haven, A. G. Brailey; George Haven, V. G. Casten; George Haven, E. C. Glover; George Haven, R. A. Goodell; George Haven, D. L. Halbersleben; George Haven, G. E. Lindskog; George Haven, E. G. McGavran; George Haven, A. V. Migliaccio; George Haven, T. A. C. Rennie; George Haven, T. D. Spies; George Haven, J. D. Stewart; George Haven, J. H. Talbott.

TEACHING OF PUBLIC HEALTH NURSING AT SIMMONS COLLEGE

IT is reported that there is danger of suspension of the courses on Public Health Nursing at Simmons because of the financial burden imposed by this department. This feature of instruction has been very valuable and if the College finds that contributions are not forthcoming it may be necessary to retire from this field of instruction.

The work carried on in this department is regarded as especially important. The graduates in Public Health Nursing have met the approval of Public Health organizations.

Simmons has not received the financial support to which it is entitled. The medical profession may very properly endeavor to interest charitably disposed persons in the needs of this College.

THE GORGAS MEMORIAL INSTITUTE

THE Gorgas Memorial Institute seems to be accomplishing its initial purpose of uniting laymen and doctors, and instilling into the masses a recognition of the fact that scientific medicine is the only proper authority in health matters.

The Gorgas Memorial Institute evidences a healthy growth from the Atlantic to the Pacific. The value of periodic health examinations is a subject that the foundation is stressing in hundreds of newspaper articles, in public talks and in radio addresses, the country over.

Scores of editorials have been written and published by leading newspapers. Without exception they have deep sympathy with the ideals of the organization and heartily endorse it.

A special article written by the *Detroit Saturday Night* and appearing in the issue of Feb. 14 is pertinent. It reads in part:

"Quacks and quackery in the field of medicine and general health protection will receive a heavy blow when the Gorgas Memorial Institute, recently founded in honor of the great army medical man who showed the world that yellow fever and other pestilences could be con-

quered by preventive methods, gets functioning."

"The Institute is not heralding as one of its purposes the counteracting of propaganda such as is spread by Bernard Macfadden and others of his kind who use every opportunity to attack the medical profession, but just so far as its plans, as announced, are successful, it will help to overcome pernicious teachings and ignorance regarding health."

The article goes on to say:

"The Institute will carry out General Gorgas' ideas of the exercise of preventive measures and the use of scientific medicine to check diseases and wipe out pestilence. It is estimated that modern ideas of sanitation, coupled with the principle of periodic examinations such as General Gorgas practiced in the United States army during the world war, would mean a saving of $1,500,000,000 annually. And the decrease in sickness and increase in happiness would be worth as much more.

"On any given day there are 3,000,000 people on the nation's sick list. One million of these are gainfully employed. The daily loss from this one source is staggering."

The County Societies are also proving receptive to the Gorgas Idea. They see in the movement a plan which will aid each member individually.

FOUR RECOVERED LEPERS ARE DISCHARGED FROM NATIONAL LEPROSARIUM

Four lepers who went to U. S. Marine Hospital No. 66, Carville, Louisiana, the National Home for Lepers, a few years ago, have been discharged, according to a statement by Surgeon General Hugh S. Cumming of the United States Public Health Service. They are no longer a menace to the public health, the disease having been cured, or, according to official parlance, "arrested." The conditions under which lepers are released from this institution are exceedingly rigid. They require special observation for a period of one year, including monthly bacteriological examinations to show that the leprosy bacillus is absent from the tissues. Certification of cure is also required from a board of three medical officers stationed at the hospital and experienced. in leprosy.

The treatment at Carville includes the use of chaulmoogra oil, special preparations of mercury used intravenously, X-ray therapy, surgery of superficial areas of involvement, hydrotherapy, and the violet ray. The results of treatment have been sufficiently encouraging at this institution to induce numerous other patients, of whom there are believed to be several hundred in the United States, to agree to their transfer. A special car fitted up for the purpose, and carrying a doctor and a nurse, was used in the transfer of eleven patients from Florida, and seven were brought from California. There are at present 236 leper patients at Carville.—*United States Public Health Service.*

PROGRESS MADE IN CONTROL OF CANCER

Dr. Howard Canning Taylor, of No. 20 West 53d Street, Professor of Clinical Gynecology of the College of Physicians and Surgeons, and President of the American Gynecological Society, was elected President of the American Society for the Control of Cancer at the annual meeting of the Society held March 7, 1925. Thomas M. Debevoise was reëlected Secretary and Calvert Brewer was again elected Treasurer. Dr. Francis Carter Wood was elected Vice-President.

In the annual report of Dr. George A. Soper, Managing Director, evidence was presented to show that the efforts of the Society to acquaint the public with the early symptoms of cancer had borne fruit throughout the country.

The latest report of the Pennsylvania Cancer Commission showed that in Pennsylvania, from 1910 to 1923, the average time between the first symptoms and operation in superficial cancer cases had dropped from 18 months to 14.6 months, and that the average time between which a patient consulted a physician and was operated on dropped from 13 months to 4.5 months. Where deep cancers were concerned. the results were even more striking.

Reports from the 53 State Chairmen of the American Society had shown that in each State cases were coming earlier to physicians and consequently with a better prospect of cure.

The Society's efforts for the year had included systematic work among the public, members of the medical profession, nurses, dentists and students at medical colleges. The Society's publications had all been revised to contain the latest information. Exhibits had been made at many notable meetings of professional men and women.

With reference to clinics, the cornerstone of a permanent institution had been laid in connection with the Medical School of the University of Minnesota, the funds having been provided by Mrs. George Chase Christian, a member of one of the Society's committees. A temporary clinic had been successfully operated at Fall River, Massachusetts, under the direction of Dr. E. P. Truesdale of that city, aided by Dr. Francis Carter Wood.

In coöperation with the Connecticut Medical Society, the Connecticut Public Health Association and the Connecticut State Department of Health, the Society had begun a three-years' campaign in Connecticut during which it will turn to account the experience it has gained elsewhere in cancer control.

The Director's report showed that inquiries for information have greatly increased during

the twelve months. They included letters from physicians of England, Spain, Cuba and Italy who wished information to guide them in the conduct of campaigns for the control of cancer in their countries.

Dr. Soper recommended that during the coming year work be continued along present lines and broadened in some directions; that "cancer week" be generally held; that further efforts be made to enlist the coöperation of dentists, nurses and social workers; that the work undertaken in Connecticut be extended to other States, and that the Pennsylvania Survey be duplicated elsewhere in the country.

A FEE SPLITTING OFFER

A MANAGER of a "rest or home for invalids" in a nearby city has sent a letter to a prominent physician, a copy of which with the answer, with names omitted, is as follows:

"My dear Dr.———:

As I am very anxious to establish and build up my business, I am giving $25 for every patient or elderly person sent here through your kindness.

Best of references and service given.

Sincerely,

_____"

(reply)

"Dear Mrs.——:

I received your letter in regard to the home that you are running for invalids. The offer you make is entirely unethical in my estimation and is quite equivalent to the fee splitting which has been a feature of medical practice in certain communities that has caused a great deal of criticism. Perhaps you did not look upon it in that light, and, if so, would not have made the offer.

Very truly yours,

_____"

With the possibility that the author of the letter is ignorant of the common principles of medical ethics we refrain from publishing her name. This unfortunate appeal will do a great deal toward the defeat of this person's desire for business. The only course open to her is to plead ignorance and give assurance of reformation.

A STUDY OF FEDERAL HEALTH WORK

MR. JAMES A. TOBEY, recently administrative secretary of the National Health Council, is now engaged, under the auspices of the Institute for Government Research of Washington, D. C., in making an intensive survey of the public health activities of the United States Government. Preliminary studies have shown that there are at least twenty-six bureaus or other branches of the government which are directly or indirectly interested in some phase of public health. Sanitarians have long recognized the desirability of an effective coördination of these scattered functions and have frequently recommended that it be brought about. An endeavor will be made, with the advice of the most distinguished health workers and specialists in political science of the country, to formulate a definite plan for correlation, providing for no new expansion, but simply a more effective and economical rearrangement of existing Federal health activities. Students of government and of public health agree that the problem is a complex one, but it is hoped that a practical scheme may be ready for presentation to the Sixty-Ninth Congress when it meets next December.

A CORRECTION

THE report of changes at the Malden Hospital should have stated that the Medical Board had resigned. This Board is an advisory body. The Staff continues as before.

REMOVALS

DR. R. M. KIMBERLY has moved his office from 29 Pearl Street to 28 Pleasant Street. This office was formerly occupied by the late Dr. G. W. Farnham.

DR. HAROLD V. WILLIAMS of the City Hospital has opened an office in Whitinsville for the general practice of medicine.

RECENT DEATHS

CARMICHAEL.—DR. JOHN HOSEA CARMICHAEL, a member of the Massachusetts Homeopathic Medical Society since 1874, surgeon-in-chief of the Wesson Memorial Hospital, Springfield, since its foundation in 1907, died at that hospital March 7, 1925, at the age of 74.

He was born at Sand Lake, N. Y., January 29, 1851, and there he acquired his elementary education, graduating from the public schools in his 15th year. He prepared himself for the teaching profession at Schrams Academy, Sand Lake, and at Nassau Academy, from which he was graduated in 1867. He taught in various New Jersey schools until he commenced a course of study in the office of Dr. Oliver J. Peck of North Chatham, N. Y. He continued there until his graduation from the Albany Medical College in 1873.

Dr. Carmichael began his career in medicine in Worcester, where he was a resident until 1876, removing at that time to Warren, where he remained until 1878. He then went to New York City to take postgraduate work at the New York Homeopathic Hospital.

In 1883 he took up his residence at Boston, but in June the following year he went to Springfield. He was one of the promoters of the Hampden Homeopathic Hospital, which later became the Wesson Memorial, of which Daniel B. Wesson, millionaire manufacturer of revolvers, was the benefactor.

Dr. Carmichael was a member of the Surgical and Gynecological Society of Boston and served as its president in 1884; of the Western Massachusetts Homeopathic Medical Society, of which he was president in 1885; of the Worcester County Homeopathic Society, of which he was president in 1879; of the American Institute of Homeopathy, the Massachusetts Homeopathic Medical Society and of the American College of Physicians and Surgeons. He held a mem-

bership in the Springfield Lodge, Free and Accepted Masons; Masonic Club, Automobile Club, Fish and Game Club, and the Springfield Driving Club, of which he was president.

In 1875 he married Anna Elizabeth Spencer of New Lebanon, N. Y. He is survived by his daughter, Pauline, now Mrs. John Walcott Calder of Utica, N. Y.

SHEEHAN.—Dr. William Joseph Sheehan died at his home in Salem of heart disease, after a long illness, on March 17, 1925, at the age of 58.

He was a native of Boston, where he was born April 20, 1866, and was graduated from Boston College in 1888 and from the Harvard Medical School in 1891. He went to Heidelberg University and studied hospital methods and practice in Berlin, Munich, Vienna, and in Dublin, Ireland, being a licentiate in midwifery at the Rotunda.

After a short period of study and practice in London hospitals he came to Salem in 1895 and had since practised there. He was a member of Salem Council, K. of C., and of the Massachusetts Medical Society.

Surviving relatives are his widow, Mrs. Catherine Anglin Sheehan, one son and four daughters.

WASSERMANN.—The Associated Press has reported the death at Berlin, March 16, of Professor August von Wassermann, director of the Kaiser Wilhelm Institute for Experimental Therapy and professor of internal medicine at the University of Berlin, the originator of the celebrated Wassermann blood test. Professor Wassermann was one of Germany's greatest medical research men. He was 59 years old.

OBITUARY

Resolutions of the Staff of the Somerville Hospital on the Death of Dr. Charles F. Maguire

Resolved:

1. That in the death of Dr. Charles F. Maguire, the Somerville Hospital has lost one of the oldest members of its staff, and the Medical Board a most wise counsellor.

2. That the Staff has lost a strong and loyal worker, and one who was ever conscientious, conservative and just.

3. That the profession has lost a distinguished and active member whose memory, to us who are still in the ranks of the workers, should be a forceful aid in holding fast the ideals of our profession, and in enduring with courage and equanimity the burdens that life may put upon us.

4. That Dr. Maguire's many friends, while keenly feeling their loss, will recall with deepest pleasure a pleasant companion, a man of polished manner, genial conversation and high ideals.

5. That these resolutions be spread upon the records and that copies of them be forwarded to Dr. Maguire's family and to the Boston Medical and Surgical Journal and the *Somerville Journal* for publication.

Signed:

Timothy J. Shanahan, M.D.,
Chas. E. Mongan, M.D.,
Henry F. Curtis, M.D.

CORRESPONDENCE

A HOME-MADE PESSARY IN SITU FOR THIRTY YEARS

Mr. Editor:

A note in the January 7th number of the *Journal of the American Medical Association* on "The Pessary as Cause of Cancer," taken from an article by L. W. Sambon (*Proc. Roy. Soc. Med.*, 60:115, Sept., 1924), brings to mind the following case.

A married Polish woman of 65 years was seen during a recent service in the Surgical Out-Patient Department of the Massachusetts General Hospital. The patient had recently arrived in this country and was brought to the clinic by her daughter, on account of an increasingly offensive leucorrhoeal discharge. The history was that the patient had manufactured a pessary from paraffin and tow, thirty years ago, apparently for the relief of a cystocele, had inserted it, and worn it ever since, with little discomfort until recently. Examination showed the pessary heavily encrusted with lime salts and firmly fixed. It was necessary to cut it in halves, and it was then extracted with some difficulty. There was surprisingly little excoriation of the vaginal mucosa, though the pessary felt like a section of crowbar. The cervix showed nothing remarkable.

In the note referred to above Sambon says, "Were irritation and ulceration necessary for the production of cancer in the cervix, surely, as pointed out by Sir John Bland-Sutton, the pessary would be a chief cause."

Very truly yours,

Wm. Pearce Coues, M.D.

Brookline, Mass.
March 13, 1925.

WHEN DOES ONE BECOME A SPECIALIST?

44 Saratoga Street, East Boston,
March 14, 1925.

Editor, Boston Medical and Surgical Journal:

This is indeed the age of specialists, but when is one permitted to assume the coveted title is what puzzles me greatly, and for the following reasons: I have been in general practice for the last nine years. My rather unusual (in this age) liking for this sort of practice, together with the mathematical impossibility of charging more than the meagre fees in this community, has kept me to my humble task.

About seven or eight years ago I was asked by the Baby Hygiene Association to take charge of the only station in East Boston at that time. The work was simple enough, and, with the knowledge gained in a Class A medical school, I went right to it. The clinic proved a success, and by now we have with us in East Boston three well-attended baby stations. It so happens that during all those years I have been in charge of one of the largest of the three, and from various signs I have reasons to believe that my humble efforts were well appreciated both by the mothers that came to the clinics and by the heads of the Association.

Now, I don't know if that puts me in the ranks of specialists, since there must be various grades to that title, as specialists themselves often claim.

Without calling myself a specialist, I, nevertheless, felt competent enough to cope with the simple problems appearing at such clinics. And, all of a sudden (human happiness is not destined to endure), a letter from the Board of Health, under whose supervision the clinics have come of late, that my services were no longer needed. Reason: Our leading medical schools of Boston have taken over the whole works and will furnish their own personnel. Feeling that I was somewhat instrumental in the

building up of at least one of the clinics, I called for more detailed explanations (not from the Board of Health) and was given gently to understand that from now on nobody but specialists will be permitted to conduct those clinics.

And here is where I come to my original question: When does one become a specialist?

Very truly yours,
R. GURALNICK.

NURSES AS ANESTHETISTS

March 4, 1925.

Editor, Boston Medical and Surgical Journal:

I have read with considerable interest your editorial in the issue of February 26 entitled "Some Economic Features of Practice."

I believe the economic law of supply and demand holds true as to the subject matter under discussion as well as elsewhere. If so, there must be a large and increasing demand on the part of the medical profession for nurses as anesthetists, for the supply has in the past few years and is now increasing at a rapid rate. Not only are many nurses "limiting their practice of nursing" to the giving of anesthetics but also many of the nurses in charge of hospitals are making a direct bid for this work. There would seem to be only one logical outcome to this movement, namely, that ultimately the giving of anesthetics will be in the hands of the nurses entirely. If the medical profession is dissatisfied with this outcome they will have no one but themselves to blame for it; certainly the nurses have not created the demand. It is also certain, with the present drift toward nurse anesthetists, that the young medical graduate, no matter how much he may be interested in the science of anesthesia, will not be willing to enter a field occupied by nurses which would offer so little to him in the way of either practice or advancement. Who, then, would instigate the progress in anesthesia? A nurse without any scientific or medical training? To ask the question is to give sufficient answer.

In your editorial you say "ether is often spoken of as fool-proof." The details of an instance in which a nurse administered ether from which the patient never regained consciousness have been given to me where in the judgment of the operating surgeon the death was directly due to the giving of the ether. How many of the same sort there may be no one can ever find out, for, naturally, no one wishes to publish the details of negligence, and of course the family of the patient never knows the cause of death. Accidents have occurred at the hands of the most expert anesthetists, when details of the occurrence are gladly published for the benefit of others. But surely if the drug is so potent for damage is there not a tremendous moral and ethical responsibility on the shoulders of the surgeon who is willing to deceive the public and risk a patient's life by employing a nurse untrained in medicine to give an anesthetic? The public and the medical profession in England feel so strongly about the seriousness of giving an anesthetic that not even the ordinary graduate in medicine nor dentist is allowed to assume the risk, but the work must be done by a registered anesthetist.

It is an anomalous situation that in all the bills that come before the Legislature concerning nurses the remark is always made that there is a shortage of nurses and bills are introduced to register nursing attendants to overcome this shortage; while at the same time the medical profession is deliberately withdrawing the nurse from her proper sphere, the one for which she is trained, and asking her to conserve the life of a patient under an anesthetic when she has not been trained in the physiology of respiration, the vagaries of the circulation and the functions of the body in health and disease. Surely there is an "economic feature of practice" to be found here.

Another aspect of the question is suggested by your letter quoted from the California Examining Board. In the grading of hospitals by the American College of Surgeons presumably the matter of nursing anesthesia has been considered and data obtained as to the number of hospitals where nurses are so used. Has the College faced the question squarely and made a decision according to its best judgment or has it merely sidestepped the issue? The medical profession through its existence has been held in high esteem and looked up to as an altruistic profession which is always ready to sacrifice its own advantage for the benefit of humanity and the greatest public good. In the light of this reputation can it afford in this instance to be accused of urging nurses to adopt a line of work which may at any time lead them into the courts to face perhaps both civil and criminal charges, merely for the convenience of the surgeon?

In view of this situation there would seem to be only two alternatives as a final solution. Either the nurse should be protected in her legal status by bringing a test case or friendly suit or whatever device may please the court, and if it is found that she is without authority to proceed as an anesthetist, then to bring before the Legislature a bill to give her the necessary rights, always assuming that the majority of the medical profession believe it is for the best interest of humanity and for the better serving of the public health to do so. If the majority do not believe this is the better course, then the only other alternative is for the doctors to clean house for themselves and abolish a practice which seems to be carried on now for the convenience of the doctor himself. I am reminded that in 1911 the Toledo, Ohio, Academy gave two of its surgeons 24 hours in which to discontinue nursing anesthesia or lose their membership. In this instance these surgeons abandoned nursing anesthesia. Is there a problem here for the Committee on Ethics and Discipline to attack?

A. E. SMALL.

205 Beacon Street, Boston, Mass.

LONDON LETTER

(*From Our Own Correspondent*)

EDUCATIONAL CONFERENCE IN LONDON

Of course, at an educational conference many points regarding the health and care of children and youths are discussed, and the one held recently in London was rich in such discussion. Moreover, as the trend nowadays of medicine and medical treatment appears to be in the direction of prevention, it is fitting that the subjects dealt with should be referred to in a medical journal. The chairman of the Food Education Society, Dr. Harvy Campbell, a well-known authority on diet, stirred up a hornet's nest around his ears by his views on "School Diet." In the course of a paper on the subject Dr. Campbell condemned in unsparing terms preserves and candies, especially candies; the "pernicious pudding" and the school tuck shop. The tuck shop is an institution peculiar to the schools for the progeny of prosperous and well-to-do in Great Britain. They are shops from which scholars can obtain luxuries in the way of candies, preserves and various items of diet absent from the routine diet of the schools. According to Dr. Campbell it would be a great gain to the country if all these candy shops were converted into green grocery and fruit shops. Sugar, in his opinion, should be used only in moderation, because the body gets all the sugar it needs from the starchy foods eaten. He believes that excess of starch and sugar are largely responsible for the

prevalence of adenoids, and, besides, render teeth carious, and are the great factors in the production of pyorrhea alveolaris.

The tuck shop he described as an evil institution and its existence bears out in a striking way the truth of Sir George Newman's contention that the nation fails to keep pace with the advance of sanitary science. The four requisites necessary for the development of our youth, said Dr. Campbell, are: Fresh air, suitable food, appropriate muscular exercise, and peace of mind; and upon the school authorities rests the great responsibility of securing these requisites. The food provided should be simple and of the right kind. It is essential that the appetite of the young should not be pampered. If the appetite of the youth fails let him wait until it comes back. An occasional rest for our digestive organs is good for all of us. On the question of mastication, which few people understand properly, and digestion, Dr. Campbell observed that it was better to be born a healthy pauper than a sickly millionaire. Complaints of the monotony of school diet left him unmoved, because normal youth does not tire of good food.

Puddings and pastry of all descriptions should be barred; milk is not essential as such and is valuable chiefly because it provides butter and cheese. Next to cod liver oil, butter contains most fat solubles and vitamins. Fresh, uncooked fruits and raw salads are of the greatest importance and one or both should be taken daily. We want a Spartan life for our children; let them pamper themselves when they get older if they must. Dr. Campbell's denunciations of candy and puddings almost ad libertum for children and growing youths met with both opposition and agreement. His contention that youths and adults eat too much pappy, predigested food is founded on sound premises, and there is little doubt that too much sugar and starchy foods are responsible for a considerable proportion of the tooth and gum troubles which are so markedly present in these times.

Lecturing to the Eugenic Education Society, Professor H. J. Fleure said that he wished to emphasize the apparently very simple truth that there were many "bests." In any search for the best they must be on their guard against any desire to simplify matters unnaturally by placing us all on the same ladder at different levels or by treating us all in three groups: subnormal, normal or supernormal. It was wrong to suppose that there was a general factor called "ability," which could express itself in many ways according to opportunity, and that we might test this general ability without close reference to individual aptitude. A good deal of the Nordic race entered into the composition of the English race, and he believed that it was of great value to England, but it was only one of the best types, and was only best in certain circumstances and environments. The creation of the British Empire, based as it was upon coal and slums, made it very difficult for the Nordic type to remain and to find the scope that it required.

The congestion of the large towns was very unfavorable to this type. The complications of social life and modern conditions were altogether hostile to the simple mentality of the race, characteristics of which were expressed in the old motto, "Ride well, shoot straight, and speak the truth." The spread of British people over far lands and the creation of slums in Great Britain had driven this type on to Canada, South Africa, Australia and New Zealand. It was not by any means certain that this type could in the end survive in many of these lands.

Professor M. W. Keatings referred to the eugenists' desire that the parties to every marriage should be required to possess a clean bill of health, and said that they must work at this problem as indirectly as possible. The public was not ready yet, perhaps it never would be, to have its habits interfered with by legislation beyond a certain stage.

Under the auspices of the Child-Study Society, Professor E. W. MacBride lectured on "The Evidence for the Existence of Environmental Influence on the Course of Heredity." The subject, he said, transcended in importance any other subject to the lovers of children. After reviewing evidence, which he illustrated by means of lantern pictures, that acquired habits affect heredity, he said that owing to the development of human sympathy we were in the present day taking more care than formerly of defectives. No restraint was put upon their productiveness, and this, he thought, was a most dangerous line of conduct. A scientific man had said that these people would die out, but that was not true, and their descendants were a burden on the community. He saw only one hope and that was to take steps to limit the production of these people.

Dr. Lucy Wilson, principal of the South Philadelphia High School for Girls, addressed the conference on "Examination Results under the Dalton Plan." Dr. A. W. Kimmins, who presided over the section, said that London had been very unkind to Dr. Wilson, as since her arrival she had been knocked down by a 'bus, though fortunately she had not sustained any injury. Dr. Wilson gave a comprehensive review of the work accomplished by the Dalton Plan in the South Philadelphia School for Girls and in other American schools in which the system was being developed. Passing in review the achievements of many of America's greatest educational scientists, Dr. Wilson went on to say that thousands of their schools were scientifically segregating their pupils. They were not only teaching the children in accordance with their abilities, but were helping each one to function in curricular and extra-curricular activities in a spiritually rich and happy school environment, so that each child had actually equal opportunity to acquire right habits and right attitudes, to develop skill, and acquire knowledge.

Referring to the increasingly heavier taxes imposed in America to support public education, the speaker said that the people were fortunately beginning to realize not only that education was worth all that it cost, but that only in education could they find the answer to their social problems.

PURE FOOD CAMPAIGN

Sir Kingsley Wood, M. P., who has been appointed Parliamentary secretary to the Minister of Health, spoke the other day on the situation as regards health and disease. He pointed out that prevention must be the great watchword of the Ministry of Health, and one of the greatest needs in regard to health matters in the immediate future was research. We were still in the dark concerning the cause of measles, influenza, cancer and rheumatism. We had yet to learn the relationship of certain foods to particular diseases. We needed today not only cheap but good food, and this was vital to the production of a healthy and vigorous race.

The Health Ministry was deeply concerned with the important question of pure food. Good, clean and wholesome food is an effective weapon against disease and premature death. There has been a considerable rise in the standard of national nutrition, and it has been, for instance, an important and favorable factor in the decline of mortality from tuberculosis. The consumer must more and more today, however, be guarded against contaminated, adulterated, and disease-producing food. We more often choose our foods by reading advertisements than by trusting to our natural tastes. We love to see some of our vegetables very green, and so accordingly they are canned and colored for us. Dirty and dusty milk, the careless handling of meat and bread, our doctored butter, the boron preserved sausage, the

boracised egg, the mixture of sugar, artificial flavoring and benzoid acid, sometimes called ginger-beer, are not the best illustrations of our advance in national health conditions.

It is quite possible to imagine a reasonable meal which might contain 20 or even more grains of boric acid besides other preservatives. In those respects Great Britain is undoubtedly behind the standard of many other countries. There is fortunately a general movement in various parts of the civilized world in the direction of limiting and controlling the admixture of chemical preservatives and coloring matter with foodstuffs. That movement he was glad to think had the support in this country of the great majority of the trades themselves, who were equally anxious to see a good pure food supply.

Mr. Neville Chamberlain, the Minister of Health, had the matter well in hand, and already certain regulations were being framed on the basis of the recommendations of an expert committee, which had inquired recently into the whole subject. Those regulations would first be published in order that persons interested might submit, if they desired, recommendations to the Ministry. Certain of the recommendations could not be effected without legislation, but it was proposed to undertake this as soon as pressure on Parliamentary time permitted.

The Ministry hoped also to promote a measure consolidating the whole of the law relating to food. But while laws were necessary and regulations were desirable, to a large extent, the vital matter of clean food rested with the nation itself. The public had been asked recently by the Ministry, for instance, to refrain from the common practice of handling meat before purchasing. Nobody desired unnecessary regulations, but in connection with our food we must cure ourselves of old bad habits, and education could help a great deal to achieve the advance so necessary with regard to the attainment of a purer and cleaner food supply.

THE SALE OF PATENT MEDICINES

The sale of patent and proprietary medicines is another question which is better managed in several other countries, and perhaps in America in particular, than in Great Britain. *The Lancet* of January 10 last published a supplement in which existing laws and the abuses present were reviewed at considerable length. It seems likely that certain reforms in this direction will be instituted.

NEW YEAR HONORS TO THE MEDICAL PROFESSION

The following have received the honor of Knighthood: Mr. John Campbell, senior surgeon to the Samaritan Hospital, Belfast; Dr. Thomas Monson Legge, medical inspector of factories; Mr. Holburt J. Waring, formerly vice-president of the Royal College of Surgeons and vice-chancellor of the University of London, surgeon to St. Bartholomew's Hospital; Professor Gowland Hopkins, professor of biochemistry in the University of Cambridge; Mr. Henry J. F. Simson, obstetric surgeon to West London Hospital; Dr. Frederic Iruby King, director of Child Welfare Division, Department of Health, New Zealand; and Major-General Robert C. Macwatt, director-general of the Indian Medical Service.

Miss Louisa Aldrich-Blake, dean of the London School of Medicine for Women, is appointed Dame Commander of the Order of the British Empire.

Also the new appointments to the Order of Merit possess scientific interest. Sir Ernest Rutherford, Cavendish professor of experimental physics and director of the laboratory at Cambridge University, as is well known, has made researches in radioactivity, for example, which may have an important bearing on the medicine of the future. Sir James George Frazer in "The Golden Bough" has touched upon problems of anthropological and philosophical concern.

BICENTENARY OF GUY'S HOSPITAL

On January 6 last the 200th anniversary of the opening of Guy's Hospital was commemorated by a service in Southwark Cathedral. The Prince of Wales, president of the hospital, attended the service, and Dr. Burge, Bishop of Oxford, one of the governors, preached. There was a crowded congregation which included many distinguished medical men and members of the nursing profession.

Further and more lengthy comments on this notable event will be made in a subsequent letter.

CONNECTICUT DEPARTMENT OF HEALTH

WEEKLY MORBIDITY REPORT FOR THE WEEK ENDING JANUARY 24, 1925

(Including all cases reported before 11 A. M., Monday, January 26, 1925)

Diphtheria

Fairfield County	
Bridgeport	6
Fairfield	2
Norwalk	1
Stamford (C)	1
Stratford	1
Hartford County	
Bristol	1
Hartford	12
New Britain	6
Wethersfield	1
Windsor	2
Litchfield County	
New Milford	1
New Haven County	
East Haven	1
Meriden (C)	2
Middlebury	1
New Haven	1
Waterbury	4
Windham County	
Sterling	1
State total	44
Last week	70

The following diphtheria bacilli carriers were reported:

Hartford	4
Milford	1
New Britain	2
New Haven	3
New London	1
Norwalk	4
Waterbury	2

Scarlet Fever

Fairfield County	
Bridgeport	23
Danbury (C)	3
Norwalk	1
Ridgefield	1
Shelton	6
Stamford (C)	1
Stamford (T)	6
Westport	1
Hartford County	
Berlin	2
Bristol	7
Hartford	9
Manchester	4
New Britain	16
Southington	3
Suffield	1
West Hartford	1
Wethersfield	2
Windsor	2
Windsor Locks	2
Litchfield County	
Litchfield	2
Morris	1
New Milford	1
North Canaan	1
Thomaston	4
Watertown	6
Middlesex County	
Cromwell	1
Essex	1
Middlefield	1
Middletown (C)	3
New Haven County	
Ansonia	3
Beacon Falls	1
Hamden	5
Meriden (C)	1
Milford	1
New Haven	28
Orange	1
Wallingford (B)	2
Waterbury	7
West Haven	4
New London County	
Groton (B)	5
Groton (T)	1
Jewett City	2
Norwich (C)	3
Norwich (T)	1
Old Lyme	1
Windham County	
Danielson	2
Putnam (C)	1
Sterling	1
Willimantic	1
State total	183
Last week	179

Measles

Fairfield County	
Norwalk	2
Stamford (C)	1
Middlesex County	
Chester	22
East Hampton	1
Old Saybrook	1
Saybrook	1
New Haven County	
Branford	1
Hamden	1
New Haven	8
West Haven	1
New London County	
Groton (T)	3
State total	42
Last week	44

Whooping Cough

Fairfield County	
Fairfield	2

Norwalk	2
Stamford (C)	6
Stamford (T)	1
Hartford County	
Bristol	11
Hartford	14
New Britain	1
Simsbury	1
Middlesex County	
Chester	3
New Haven County	
Hamden	7
New Haven	8
Waterbury	3
New London County	
Groton (B)	2
New London	5
Tolland County	
Stafford Springs	1
State total	67
Last week	61

Typhoid Fever

New London County	
New London	1
State total	1
Last week	3

Other Communicable Diseases

Cerebrospinal men.	1
Chickenpox	99
Encephalitis epid.	2
German measles	32
Influenza	4
Mumps	31
Pneumonia (broncho)	45
Pneumonia (lobar)	56
Septic sore throat	2
Tuberculosis (pul.)	28
" (other forms)	4
Gonorrhea	19
Syphilis	19

Morbidity Report for the Week Ending February 7, 1925

(Including all cases reported before 11 A. M., Monday, February 9, 1925)

Diphtheria

Fairfield County	
Bridgeport	4
Norwalk	1
Shelton	1
Stamford (C)	1
Stratford	2
Hartford County	
Berlin	2
Bristol	3
Enfield	3
Hartford	13
New Britain	8
Windsor	1
New Haven County	
Ansonia	1
East Haven	1
Meriden (C)	1
Seymour	1
Wallingford (B)	4
Waterbury	4
Woodbridge	1
New London County	
Groton (T)	1
Norwich (C)	1
Windham County	
Plainfield	1
Willimantic	1
State total	56
Last week	44

The following diphtheria bacilli carriers were reported:

East Haddam	1
Hartford	16
New Britain	3
Waterbury	2

Scarlet Fever

Fairfield County	
Bridgeport	22
Danbury (C)	1
Greenwich	1
Shelton	3
Stamford (C)	6
Stratford	1
Westport	3
Hartford County	
Berlin	3
Bristol	5
East Hartford	2
Hartford	9
Manchester	9
New Britain	37
Southington	5
Windsor	2
Litchfield County	
Morris	1
Thomaston	3
Middlesex County	
Cromwell	1
Middlefield	1
Middletown (C)	4
Portland	1
New Haven County	
Ansonia	5
Hamden	6
Madison	1
Meriden (C)	2
New Haven	37
Seymour	2
Waterbury	10
West Haven	4
Woodbridge	1
New London County	
Griswold	1
Jewett City	1
Lisbon	1
Norwich (C)	2
Stonington	4
Tolland County	
Ellington	1
Windham County	
Danielson	2
Willimantic	1
State total	201
Last week	164

Typhoid Fever

Hartford County	
Manchester	12
Windsor	1
New Haven County	
Hamden	1
New Haven	1
Tolland County	
Mansfield	1
State total	16
Last week	7

Measles

Fairfield County	
Bridgeport	1
New Canaan	1
Hartford County	
Enfield	1
Hartford	1
New Britain	2
Southington	1
Suffield	1
Middlesex County	
Chester	25
Saybrook	9
Westbrook	1
New Haven County	
Ansonia	4
Branford	3
Hamden	2
New Haven	16
Seymour	1
Waterbury	1
West Haven	1
New London County	
New London	1
Norwich (C)	1
Tolland County	
Stafford Springs	1
State total	74
Last week	124

Whooping Cough

Fairfield County	
Greenwich	2
New Canaan	1
Norwalk	2
Ridgefield	1
Stamford (C)	1
Hartford County	
Bristol	2
Hartford	13
New Britain	1
West Hartford	2
Wethersfield	2
Litchfield County	
Salisbury	1
Middlesex County	
Chester	3
New Haven County	
Hamden	3
New Haven	1
New London County	
Groton (B)	6
New London	1
Tolland County	
Stafford Springs	1
State total	43
Last week	77

Other Communicable Diseases

Chickenpox	117
Encephalitis epid.	2
German measles	23
Influenza	6
Mumps	26
Pneumonia (broncho)	62
Pneumonia (lobar)	53
Poliomyelitis	1
Trachoma	1
Trichinosis	1
Tuberculosis (pul.)	29
" (other forms)	1
Chancroid	.2
Gonorrhea	37
Syphilis	51

MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH

Diseases Reported for the Week Ending February 21, 1925

Diseases	*No. of Cases*
Anterior poliomyelitis	1
Chickenpox	224
Diphtheria	137
Dog-bite requiring anti-rabic treatment	4
Encephalitis lethargica	3
Epidemic cerebrospinal meningitis	2
German measles	353
Gonorrhea	61
Influenza	49
Measles	574
Mumps	180
Ophthalmia neonatorum	34
Pneumonia, lobar	212
Scarlet fever	369
Septic sore throat	1
Syphilis	35
Suppurative conjunctivitis	15
Tuberculosis, pulmonary	121
Tuberculosis, other forms	24
Typhoid fever	7
Whooping cough	187

Resume of Communicable Diseases January, 1925

General Prevalence

The diseases which showed an increase the last few months of 1924 are still on the increase in 1925; they are chickenpox, measles, pneumonia (lobar), scarlet fever and whooping cough.

	Jan., 1925	Dec., 1924	Jan., 1924
Chickenpox	1,394	1,242	1,747
Measles	1,321	674	2,335
Pneumonia, lobar	635	494	550
Scarlet fever	1,684	1,411	2,082
Whooping cough	529	367	547

RARE DISEASES

Anterior poliomyelitis was reported from Adams, 1; Belmont, 1; Boston, 3; Chelmsford, 1; Lawrence, 1; Rockland, 1; Worcester, 1; total, 9.

Anthrax was reported from Lynn, 2; Woburn, 1; total, 3.

Dog-bite requiring anti-rabic treatment was reported from Billerica, 1; Bolton, 2; Boston, 1; Fall River, 1; Lowell, 5; Watertown, 8; Wellesley, 3; Winthrop, 2; total, 23.

Dysentery was reported from Peabody, 1.

Encephalitis lethargica was reported from Boston, 10; Dedham, 1; Haverhill, 1; Lowell, 1; Malden, 1; Medford, 1; Methuen, 1; Newton, 2; Revere, 1; Springfield, 1; Swampscott, 1; Worcester, 4; total, 25.

Epidemic cerebrospinal meningitis was reported from Boston, 2; Everett, 1; Fairhaven, 1; Fall River, 1; Haverhill, 1; Lowell, 1; Ludlow, 1; Lynn, 1; Northampton, 1; Salem, 1; total, 11.

Hookworm was reported from Boston, 2.

Septic sore throat was reported from Belmont, 1; Boston, 7; Brookline, 1; Fall River, 1; New Bedford, 1; Revere, 1; Somerville, 1; Worcester, 1; total, 14.

Tetanus was reported from Boston, 2; Haverhill, 1; Salem, 1; total, 4.

Trachoma was reported from Boston, 2; Tisbury, 1; total, 3.

Trichinosis was reported from Boston, 4; Sharon, 5; total, 9.

DISTRIBUTION

All Communicable Diseases

	Jan., 1925	Jan., 1924
Total cases (all causes)	8,947	11,171
Case rate per 100,000 population	221.6	279.1

Certain Prevalent Diseases

Diphtheria	Jan., 1925	Jan., 1924
Total cases	578	1,079
Case rate per 100,000 population	14.3	27.0

Cities and towns noticeably exceeding their median endemic indexes*:

Cambridge	(23)	44	Auburn	(0)	7
Norwood	(1)	11	Chicopee	(6)	19
Revere	(5)	13	Pittsfield	(7)	16
Lawrence	(14)	22			

Measles	Jan., 1925	Jan., 1924
Total cases	1,321	2,335
Case rate per 100,000 population	32.7	58.3

Cities and towns noticeably exceeding their median endemic indexes*:

Dartmouth	(1)	22	Norwood	(1)	18
Fairhaven	(0)	8	Chelsea	(6)	64
Ashland	(0)	115	Haverhill	(7)	99
Boston	(337)	426	Winthrop	(5)	11
Dedham	(0)	11	Medford	(24)	30
Framingham	(2)	97	Springfield	(26)	45
Milton	(3)	31			

Scarlet Fever	Jan., 1925	Jan., 1924
Total cases	1,684	2,082
Case rate per 100,000 population	41.7	52.0

Cities and towns noticeably exceeding their median endemic indexes*:

Dighton	(0)	4	Norwood	(2)	23
Provincetown	(0)	25	Amesbury	(1)	13
Boston	(222)	455	Beverly	(6)	21
Framingham	(3)	21	Danvers	(1)	14
Hopkinton	(0)	13	Melrose	(10)	23
Swampscott	(2)	20	Holden	(0)	7
Lawrence	(6)	54	Templeton	(1)	6
Medford	(11)	32	Chicopee	(2)	14
Methuen	(4)	24	Springfield	(47)	156
Waltham	(13)	25	Dalton	(1)	11
Clinton	(3)	55			

Tuberculosis, Pulmonary	Jan., 1925	Jan., 1924
Total cases	526	470
Case rate per 100,000 population	13.0	11.7

Tuberculosis, Other Forms	Jan., 1925	Jan., 1924
Total cases	93	66
Case rate per 100,000 population	2.3	1.6

Typhoid Fever	Jan., 1925	Jan., 1924
Total cases	46	31
Case rate per 100,000 population	1.1	.8

Cities and towns noticeably exceeding their median endemic indexes*:

Pittsfield	(0)	7

Whooping Cough	Jan., 1925	Jan., 1924
Total cases	529	547
Case rate per 100,000 population	13.1	13.7

Cities and towns noticeably exceeding their median endemic indexes*:

Middleboro	(1)	11	Winthrop	(6)	25
Boston	(77)	115	Andover	(0)	19
Canton	(0)	21	Arlington	(4)	10
Milton	(1)	7	Concord	(0)	6
Chelsea	(7)	21	Somerville	(11)	30
Haverhill	(12)	23	Spencer	(0)	5
Salem	(6)	12	Greenfield	(0)	12

*The Median Endemic Index is obtained by arranging in arithmetical sequence the monthly totals of reported cases for the past five years and selecting the middle figure. The numbers in parentheses after the name of each city and town indicate the Median Endemic Index for that city or town; the numbers without parentheses indicate the cases reported during the current month.

Resume of Communicable Diseases
February, 1925

GENERAL PREVALENCE

The following diseases showed an increase during the month of February: German measles, influenza, measles, lobar pneumonia and whooping cough.

	Feb., 1925	Jan., 1925	Feb., 1924
German measles	1,470	589	107
Influenza	261	175	40
Measles	2,204	1,321	3,553
Pneumonia, lobar	798	635	546
Whooping cough	602	529	461

RARE DISEASES

Actinomycosis was reported from Boston, 1; Somerville, 1; total, 2.

Anterior poliomyelitis was reported from Boston, 1; Fall River, 1; Lowell, 1; Northbridge, 1; total, 4.

Anthrax was reported from Haverhill, 1.

Dog-bite requiring anti-rabic treatment was reported from Arlington, 1; Boston, 1; Lowell, 3; Revere, 2; West Brookfield, 2; Winthrop, 1; Worcester, 5; total, 15.

Encephalitis lethargica was reported from Amherst, 1; Boston, 3; Brookline, 1; Chelsea, 1; Leominster, 1; Newburyport, 1; Uxbridge, 1; Waltham, 1; Worcester, 1; total, 11.

Epidemic cerebrospinal meningitis was reported from Boston, 4; Chelsea, 1; Lawrence, 1; Lynn, 2; Springfield, 1; total, 9.

Pellagra was reported from Boston, 1.

Septic sore throat was reported from Amherst, 1; Boston, 7; Cambridge, 1; Haverhill, 1; Marion, 1; Medford, 1; Westfield, 1; Winthrop, 1; total, 14.

Tetanus was reported from Boston, 1.

Trachoma was reported from Boston, 3; Plymouth, 1; total, 4.

Trichinosis was reported from Ashland, 1; Boston, 3; total, 4.

DISTRIBUTION

All Communicable Diseases

	Feb., 1925	Feb., 1924
Total cases (all causes)	10,071	11,631
Case rate per 100,000 population	249.5	290.6

Certain Prevalent Diseases

Diphtheria	Feb., 1925	Feb., 1924
Total cases	497	829
Case rate per 100,000 population	12.3	20.7

Cities and towns noticeably exceeding their median endemic indexes*:

Revere	(7)	30	Holyoke	(7)	20
Concord	(0)	27			

Measles	Feb., 1925	Feb., 1924
Total cases	2,204	3,553
Case rate per 100,000 population	54.6	88.8

Cities and towns noticeably exceeding their median endemic indexes*:

Dartmouth	(0)	15	Chelsea	(4)	96
Falmouth	(2)	8	Haverhill	(6)	148
New Bedford	(13)	199	Reading	(0)	109
Ashland	(0)	39	Revere	(0)	23
Canton	(0)	21	Winthrop	(4)	43
Dedham	(0)	8	Belmont	(3)	14
Framingham	(3)	135	Medford	(9)	93
Norwood	(0)	14	Springfield	(33)	49
Quincy	(5)	79			

Scarlet Fever	Feb., 1925	Feb., 1924
Total cases	1,462	2,076
Case rate per 100,000 population	36.2	51.9

Cities and towns noticeably exceeding their median endemic indexes*:

Acushnet	(0)	6	Swampscott	(2)	11
Boston	(240)	396	Lawrence	(10)	32
Framingham	(2)	21	Lowell	(21)	35
Marlboro	(1)	10	Clinton	(1)	14
Norwood	(1)	17	Fitchburg	(4)	15
Danvers	(5)	15	Chicopee	(7)	18
Malden	(15)	35	Springfield	(39)	105
Revere	(8)	20	Dalton	(1)	9

Tuberculosis, Pulmonary	Feb., 1925	Feb., 1924
Total cases	496	418
Case rate per 100,000 population	12.3	10.4

Tuberculosis, Other Forms	Feb., 1925	Feb., 1924
Total cases	1925	1924
Case rate per 100,000 population	2.5	1.9

Typhoid Fever	Feb., 1925	Feb., 1924
Total cases	33	31
Case rate per 100,000 population	.8	.8

Whooping Cough	Feb., 1925	Feb., 1924
Total cases	602	461
Case rate per 100,000 population	14.9	11.5

Cities and towns noticeably exceeding their median endemic indexes*:

Fall River	(13)	33	Arlington	(2)	12
Canton	(0)	26	Concord	(0)	22
Milton	(1)	8	Winchendon	(0)	10
Chelsea	(4)	21	Greenfield	(2)	13
Winthrop	(5)	23	Williamstown	(0)	12

*The median endemic index is obtained by arranging in arithmetical sequence the monthly totals of reported cases for the past five years and selecting the middle figure. The numbers in parentheses after the name of each city and town indicate the median endemic index for that city or town; the numbers without parentheses indicate the cases reported during the current month.

NEWS ITEM

APPOINTMENT OF NEW MEDICAL DIRECTOR OF MASS. SOCIETY FOR MENTAL HYGIENE

The Massachusetts Society for Mental Hygiene announces the appointment of a new Medical Director. Dr. Henry B. Elkind has already assumed the office and is ready to carry on the work which Dr. Pratt, the previous Medical Director, had so successfully developed.

Dr. Elkind has spent the past year and a half at the Harvard School of Public Health where he specialized in the field of mental hygiene in industry. His experience and training is varied and has included an assistant physicianship at the State Hospital for Mental Diseases at Howard, Rhode Island. He has done some work in psychology at Clark University and was graduated from Tufts College Medical School in 1915. Dr. Elkind is a member of the Massachusetts Medical Society, the New England Society of Psychiatry, the American Psychiatric Society, and the American Public Health Association.

NOTICE

MEMBERSHIP DUES

By vote of the Council the annual dues should all have been paid on or before March first, and further that the names of delinquents after this date should be taken from the list of fellows entitled to receive the JOURNAL.

As soon as the corrected list is submitted by the treasurer the list will be revised.

Please pay the annual dues now if this obligation has been neglected.

Notices of meetings must reach the JOURNAL office on the Friday preceding the date of issue in which they are to appear.

REPORTS AND NOTICES OF MEETINGS

THE annual meeting and dinner of the Lynn Medical Fraternity was held at Huntt's Ban-

quet Hall, Lynn, on March 16, 1925, at 6.30 p. m.

Following the election of officers the society listened to papers by Dr. William David Smith on Syphilis of the Heart and Blood Vessels, and a presentation of the subject of goitre and its treatment by Dr. Dwight Sisco.

WM. T. HOPKINS, *Reporter.*

Physiological Conference will be held Wednesday, April 1, in the Bowditch Library, Building 3, Harvard Medical School, at 4 p. m. Title, "The Site of Pneumonia Formation." Speaker, Dr. Sidney Bliss.

THE MASSACHUSETTS PSYCHIATRIC SOCIETY

A MEETING of the Massachusetts Psychiatric Society will be held at the Boston Psychopathic Hospital, 74 Fenwood Road, Boston, Mass., Tuesday, March 31st, at 8 P. M.

PROGRAM

Dr. William T. Hanson—"Problems Concerning the Criminal Insane"

Mr. Herbert C. Parsons—"Juvenile Delinquency and Probation"

R. M. CHAMBERS, M.D.,
Secretary and Treasurer,
Mass. Psychiatric Society.

WACHUSETT MEDICAL IMPROVEMENT SOCIETY

THE Regular Monthly Meeting of the Wachusett Medical Improvement Society will be held at Holden District Hospital on Wednesday evening, April 1, 1925, at 7:30. Dr. F. W. George of Worcester, Mass., will favor the Society with a paper entitled: "Some Orthopedic Problems."

NOTES FROM THE WORCESTER DISTRICT

THE regular monthly meeting of the Worcester District Medical Society was held on Wednesday, March 11th, at St. Vincent's Hospital. The routine business meeting was held at five-thirty followed by a fine supper in the dining room at six o'clock.

President Bragg called the society to order again at seven-thirty in the auditorium of the new Nurse's Home. A very interesting program was then presented by members of the Hospital Staff. The speakers and their subjects were:

1. A Case of Tortion of an Appendix Epiploica—Dr. M. F. Fallon.
2. Cancer of the Small Intestine—Dr. A. E. O'Connell.
3. Methods of Diagnosis in Genito-Urinary Cases—Dr. R. F. Mathews.
4. Anesthesia in Obstetrics—Dr. S. A. Bergin.
5. Radium in the Treatment of Benign Uterine Hemorrhage—Dr. W. F. Lynch.
6. A Case of Acquired Hemolytic Jaundice—Dr. J. J. Dumphy.
7. Case Report of an Old Congenital Dislocation of Hip—Dr. J. W. O'Meara.
8. Obesity as a Causative Factor in Diabetis—Dr. M. B. Fox.

The meeting was adjourned at nine o'clock. The next meeting of the Society will be a public meeting held at Elk's Hall, Worcester, on the evening of April 8th. The speaker of the evening will be announced later. This meeting is in the hands of a committee of three, of whom Dr. A. W. Marsh is chairman.

THE DOCTOR — WHENCE CAME HE?*

Some hundreds of thousands of years ago
A Prehistoric stubbed his toe
And with the pain began to yell
So that his cries filled all the dell;
A neighbor (they had neighbors then),
Sitting at ease within his den,
Hearing the cries, went to his aid—
The pristine act of the doctor trade!

The toe was cut clear to the bone
By the ragged edge of a broken stone,
And in order to stop the flow of blood
The wound was wrapped in leaves and mud.
Now the curious part of this strange tale
Is—that the toe soon ceased to ail.
To the patient—the wonder was in the skill,
To the doctor—that the treatment didn't kill.

The medicine man had a quizzical mind,
So he sought out the reason for cures to find;
What would mend a bone—relieve a pain—
And bring a patient to health again.
In order to further perfect his art
He found he needs must live apart
To study the stars—the earth—the air,
And find what he could of knowledge there.

He had no time for clothes or food
So he levied a tax when his cures were good,
And thus there grew from this custom old
The fee of a Doctor in food or gold.
Then with food aplenty and gold galore
He added each day to the scanty store
Of the proper methods to treat the ill,
And from this was evolved the magic pill.

And so, through the ages, knowledge grew.
'Twas handed down to a chosen few,
Who guarded the torch—kept the flame alive,
That unborn myriads might survive.
'Gainst disease and death they waged the fight,
Seeking always for increased light
On methods and ways and hows and whys,
To the end that Doctors should be more wise.

"Give us more light and we'll find the germs"—
Light and knowledge are synonymous terms,—
"Give us more light" was the slogan cry;
"With knowledge enough man need not die."
And now, dear Doctor, our mission tonight
Is to add our bit to the medical light.
May knowledge increase and doubts decamp
As you read 'neath the rays of this cheery lamp.

E. C. L. MORSE.

February 28, 1925.

*On the occasion of presenting to our friend, Dr. Ernest Lerol Hunt, a reading lamp in his new home at Kenilworth Road, Worcester, Mass.

A MEETING OF THE BOSTON HEALTH LEAGUE

Dr. Richard M. Smith, Assistant Professor of Child Hygiene, Harvard School of Public Health, addressed a largely attended meeting of the Boston Health League on Wednesday afternoon, March 11, at the North End Health Unit. His subject was Child Hygiene and included in its scope the infant and pre-school age child. His lecture was one of a series planned for the Health League meetings of this season to take up in turn the various phases of health center work.

Dr. Smith stressed the importance of the period from birth to six years of age, describing it as the period of greatest plasticity of mind and body, a period in which individual attention is required.

Among the more important things to consider in this period he enumerated: (1) nutrition; (2) care of the body and elimination of fatigue; (3) prevention of disease and death and the consequences of disease, and (4) mental health.

Under nutrition he stressed the importance of furnishing the growing organism with the right kind of food, emphasizing the value of breast milk, and mentioning the need for vitamines, the use of cod liver oil, fruit juices, and some iron in the diet.

Under the care of the body, or hygiene, he called attention to the need for someone, preferably the mother, to plan the child's day with attention to these things: (1) regularity, in time of food, bowel movement, recreation, etc., emphasizing particularly the importance of a regular time for the daily bowel movement; (2) rest and sleep; and (3) the elimination of fatigue, noting that a child's energy cannot be gaged by adult standards.

Under prevention of death and disease he analyzed the causes of death in this age group, dividing them into: (1) congenital conditions, which can be prevented only by proper supervision of the mother during pregnancy; (2) digestive disturbances, a group now somewhat diminished; (3) infections; and (4) accidents.

Infections are of three types: (1) respiratory, of which pneumonia is most important; (2) communicable; and (3) all others, of which tuberculosis forms the largest group. He mentioned the great advances made against the communicable diseases, noting the accomplished elimination of smallpox by vaccination and the possible elimination of diphtheria by toxin-antitoxin treatment and the hope for a similar procedure for scarlet fever in the near future. He urged the postponement of the "children's diseases" as long as possible since they are less fatal in the older age groups. In regard to tuberculosis he advised the separation of children from all persons having tuberculosis in communicable form.

Accidents, in this age group, are chiefly burns, falls and automobile accidents, and with the exception of automobile accidents show a general downward trend.

Under mental development he spoke briefly, urging all in contact with children to recognize the importance of early impressions and noting the fact that the brain reaches 90% of its adult size at this time. It is a period when children must learn to adjust themselves, and includes in its latter years the beginning of the child's education.

In caring for children under six years of age, Dr. Smith summarized, we must attempt to maintain normal physical development, protect from disease and death, and encourage proper mental development.

Dr. Smith's very interesting paper was informally discussed by Dr. Bailey and Miss Wedgwood of the Boston Health Department, Miss Draper of the Community Health Association, Mr. Cushman of the Boston Metropolitan Chapter of the American Red Cross and Dr. Wilinsky, Director of Health Units.

THE BOSTON DISPENSARY
25 BENNET STREET

At a meeting of the Clinical Staff of the Boston Dispensary, to be held Thursday, March 26th, 1925, at 1:00 P. M., Dr. Roger I. Lee will speak on the subject:

"The function of the Out-Patient Department: from the standpoint of opportunity in preventive medicine, early diagnosis and health education,"—to be followed by general discussion.

Buffet lunch at 12:30 P. M.

MEETING OF THE NEW ENGLAND HEART ASSOCIATION

The New England Heart Association met at the Peter Bent Brigham Hospital, on Thursday evening, March 19th. Dr. Paul Emerson presented a study of 203 cases of congenital malformation of the heart, which he had made in collaboration with Dr. Hyman Green at the Children's Hospital. This study included a classification of the various kinds of congenital heart lesions and a history of the cases, with clinical, laboratory and pathological findings as far as these were available.

Dr. Frederic T. Lewis addressed the meeting on the embryological development of the heart in relation to congenital malformations. Dr. Hyman Green and Dr. Kenneth Blackfan spoke briefly on the topic of the evening.

Emphasis was laid on the importance of careful clinical and pathological records in the study of heart malformations and also on the need of further investigations as to the etiology of congenital heart disease.

By use of the statistics obtained by Dr. Emer-

son and Dr. Green, the possibility of a correct prognosis and correct treatment in such conditions is made much greater.

ESSEX SOUTH DISTRICT MEDICAL SOCIETY

THE regular meeting of the Essex South District Medical Society was held at the Essex Sanatorium, Middleton, March 4, 1925. At 5 p. m. the following clinical program was presented:

1. Differential Diagnosis between Pulmonary Tuberculosis and Carcinoma.
2. Progressive Infectious Arthritis.
3. Tuberculosis complicated by Diabetes.
4. Primary Round Cell Sarcoma of the Lung.
5. Artificial Pneumo-Thorax Treatment.
6. Differential Diagnosis between Tuberculosis and Hyperthyroidism.

At six p. m. moving pictures were shown of

1. Diphtheria.
2. Smallpox.

Dinner at 7 p. m. was followed by an address illustrated with lantern slides by Dr. Frederick T. Lord entitled "Certain Aspects of the Bronchi, Lungs and Pleura.

Attendance, sixty-five.

WM. T. HOPKINS, *Reporter.*

SOCIETY MEETINGS

DISTRICT MEDICAL SOCIETIES

Essex North District Medical Society

May 6, 1925. Annual meeting at Lawrence.

Franklin District Medical Society

The next meeting of the Franklin District Medical Society will be held on the second Tuesday in May.

Hampden District Medical Society

Meeting to be held on the third Tuesday in April.

Hampshire District Medical Society

The next meeting will be held the second Wednesday in May.

Middlesex East District Medical Society

Wednesday, April 15. Harvard Club.
Wednesday, May 13. Colonial Inn, North Reading.

Middlesex North District Medical Society

April 29, 1925.

Middlesex South District Medical Society

Winter Schedule—The plans for winter meetings of the Society include the stated meeting in April, two hospital meetings, and five meetings to be held in conjunction with the Suffolk District Medical Society and the Boston Medical Library (two surgical, two medical, and one general).

Norfolk District Medical Society

March 31, 1925. Tufts College Medical School. This meeting given over to Drs. Leary and Watters for the purpose of giving us a medical examiners' talk.

Norfolk South District Medical Society

Meetings will be held the first Thursday of each month to May, inclusive, at 12 noon, at the Norfolk County Hospital, South Braintree.

Suffolk District Medical Society

April 29. Annual meeting. "Hypertension and Longevity," Dr. Harold M. Frost.

Worcester District Medical Society

April 9, 1925. Subject and speaker to be announced.
May 14, 1925. Annual meeting.

If you desire further information in regard to these meetings write to the Secretaries of the District Medical Societies (listed on page viii of the Advertising Section). The Massachusetts Medical Society Directory contains their addresses.

NEW ENGLAND STATE MEDICAL SOCIETIES

The annual meetings of the New England State Medical Societies are scheduled as follows:

Connecticut State Medical Society—Bridgeport, May 20-21, 1925.
Maine Medical Association—Bar Harbor, June 23-25, 1925.
Massachusetts Medical Society—Boston, June 9-10, 1925.
New Hampshire Medical Society—Manchester, May 19-20, 1925.
Rhode Island Medical Society—Providence, June 4, 1925.
Vermont State Medical Society—St. Johnsbury, Oct. 15-16, 1925.

BOOK REVIEWS

A Textbook of Pathology (Third Edition). By DR. WILLIAM G. MACCALLUM. 1162 pages. Philadelphia and London: W. B. Saunders Company. Price, $10.

This is the third edition of MacCallum's textbook. It does not contain a great deal that is new. He has, however, revised a number of subjects carefully, including rickets, diabetes, epidemic encephalitis, and typhus. The reviewer is glad to have another opportunity, however, to commend the book highly. It is quite different from most textbooks in that it is more than a collection of facts. The average student is led to believe that the contents of his textbook represent permanently fixed knowledge. The reader of MacCallum's book gets clearly set before him the idea that pathology is not a completed field in medicine, but that there is much still to know and that methods other than morphological are being employed in the advancement of pathological knowledge. Many subjects ordinarily included in a textbook of pathology have been omitted by MacCallum, and herein he has acted wisely, because it is well to disabuse students of the idea that to learn names and to recite descriptions is to learn pathology.

The treatment of general subjects included under such headings as "Disturbances of the Fluids of the Body," "Local Disturbances of the Circulation of the Blood," "Structure and Metabolism of the Cells," "Disturbances of Fat Metabolism," "Protein and Carbohydrate Metabolism," and those subjects included under the general heading of "Inflamation and Repair," is better than that to be found in any textbook designed for students in any language, and there is much material that would interest the practitioner of medicine who desires to keep himself informed of progress in the investigation of disease.

The illustrations in the book are numerous and admirable, again surpassing other textbooks. The space given to tumors is small compared to the size of the book as a whole, although the general discussion of the subject of tumors is adequate, as is the whole treatment of tumors from the standpoint of undergraduate medical instruction. It is impossible to refrain from noticing that the name "giant-cell sarcoma" is retained for the benign giant-cell tumor of bone, even though MacCallum states that it does not metastasize.

The reviewer has begun to wonder whether it is possible for any one man to write a wholly adequate textbook. Authors of textbooks as a whole seem to fall into the habit of rather easily drawing conclusions from the published work of others. MacCallum does not do this. His opinions, when expressed, are conservatively expressed. But, on the other hand, it is evident that he has failed, either through lack of inclination, or more probably because of lack of time, to make a careful analysis of contemporaneous work on certain subjects.

He leaves open a few subjects which seem definitely settled, because of his failure or unwillingness to appraise the value of original work. However, to meet this qualification of a textbook author would be more than could be expected of anyone who has other activities. As it is, this textbook of MacCallum's easily stands foremost in pathology and ranks with the few outstanding textbooks of any sort in this country.

Surgical Pathology. By WILLIAM BOYD, M.D., M.R.C.P. Ed., F.R.S.C., Professor of Pathology, University of Manitoba; Pathologist to the Winnipeg General Hospital, Winnipeg, Canada. 837 pages, with 349 illustrations and 13 colored plates. Philadelphia and London: W. B. Saunders Company. 1925.

This book helps fill a need of long standing for a volume bridging the gap between the manuals of surgery and the standard textbooks of pathology. Without sacrificing accurate pathological description, Dr. Boyd simplifies the picture and correlates it with the clinical aspects of such disease processes as have surgical importance. The section on the thyroid and goiter is particularly well handled and deserving of careful study. The tumors of bone are also exceptionally well considered. The illustrations are, in general, well chosen and technically good.

Occasionally statements are encountered that are at variance with the generally accepted teachings, such as that rhabdomyomas are common in children. In a few of the pathological pictures a desire for simplicity has impaired their complete accuracy, as in the description of rodent ulcer, and in omitting the characteristic phagocytoris of red cells found in the bone marrow of pernicious anemia from the description of that condition. But these are only minor matters which do not detract from the value and importance of this work.

Common Infections of the Female Urethra and Cervix. By FRANK KIDD, M.A., M.CH. (Cantab.), F.R.C.S. (England), and A. MALCOLM SIMPSON, B.A., M.B., D.P.H. (Cantab.), with additional chapters by GEORGE T. WESTERN, M.D., and M. S. MAYOU, F.R.C.S. Published by Humphrey Milford, Oxford University Press. 191 pages.

Based on a study of 650 women and children seen in the years 1917 to 1920, Kidd and Simpson have written a little book which, in its clarity, its conciseness, its inclusion of all the essentials and exclusion of non-essentials, could hardly be improved upon. Its professed aim is to present the subject of "common infections of the female urethra and cervix" in such a manner that any general practitioner may diagnose and treat these cases adequately; it does not fail in this attempt. One feels, in reading it, that the methods employed are thoroughly practical, based upon actual experience. That they are effective is shown by the summary of end results given in the appendix. There is no condition more inadequately treated than gonorrhea in women; proof of this is seen in the pessimistic attitude held by most medical men in regard to the certainty of a cure. Kidd and Simpson attack this deplorable situation manfully, and by their well-warranted optimism encourage the reader to treat his cases with renewed enthusiasm. The book is a model monograph.

Facial Surgery. By H. P. PICKERILL, C.B.E., M.D., M.S. New York: William Wood & Co.; Edinburgh: E. & S. Livingstone.

This book is written by one who has had extensive experience in "war surgery" as the surgeon in charge of the Facial and Jaw Department of the New Zealand section of Queen Mary's Hospital at Sidcup, England, and his conclusions are based mainly on this war-time experience.

Current opinion might be that books on war surgery, while of great historical interest, are not of particular value in civilian practice. However, on reading this book one feels convinced that the author has succeeded in bringing before the profession the practical application of this experience to civil practice.

The book is divided into three parts. The first part describes the principles, methods and technique of plastic surgery, in which brief descriptions are given on primary healing, anesthesia, the principles of operative procedure, and types of grafts and technique. The second part is devoted to military facial surgery. Each chapter in this section deals with a definite part of the face. The author describes the methods of repair with which he has been most successful, giving descriptive cases with illustrations. In this section he places great emphasis on the use of different types of tube flaps which he has found very useful in extensive injuries with loss of soft tissue. The third chapter deals entirely with facial surgery in civil practice, with descriptions of deformities caused by malignant growths, specific infections, innocent tumors, burns and keloids, hare-lip and cleft palate, facial paralysis, etc. The author has made valuable suggestions, and offers some original modifications of already existing surgical procedures.

Among other things the book emphasizes the possibility of performing extensive operations for the removal of malignant growths of the face without fear of causing permanent deformity of the face.

The book is well written and well illustrated with excellent photographs and it will undoubtedly form a valuable addition to the literature on plastic surgery.

Medi-Cult. By B. F. LORANCE. Pp. 73. Boston: Richard G. Badger.

The author of this little book explains briefly the difference between the physician and the cultist, and goes on with several apt illustrations to force home to the average man the validity of the established theories of disease. It is to be regretted that the illustrations of various bacteria given are crude, but elaborate cuts would be out of place in so unpretentious a volume. In the case of books like this the difficulty is that they reach the physician but not the layman.

Manual of Psychiatry. For the Student and General Practitioner. By PAUL E. BOWERS. Philadelphia: W. B. Saunders Company.

A manual to be recommended should be accurate and authoritative. When more than ten per cent. of the bibliographical references are by the same author as the text, authoritativeness is not established. Epilepsy and feeble-mindedness are properly regarded as symptoms of a variety of conditions, the majority of which are acquired and not inherited, yet the author mentions them as diseases the hereditary character of which has been thoroughly established. The statement that "25 per cent. of all admissions to institutions are due to the direct and indirect influence of syphilitic disease" is an exaggeration according to available recent statistics, which attribute about half of such a percentage to this cause. To state that amaurotic family idiocy is found only in Jewish children is not to give the facts as recently stated by Dr. Sachs. That "pluriglandular therapy is superior to the monoglandular forms of treatment" is a view based on such speculative premises as to be of questionable value in a manual. In the chapter on treatment the author states: "Occasionally it is necessary to examine the stomach contents by the Rehfuss fractional method. Such an examination may disclose the presence of virulent bacteria in the stomach contents." As such bacteria are more easily discovered in the mouth, whence they came before being swallowed, the necessity of putting a patient to so much discomfort to obtain data valueless in diagnosis or treatment is questioned.

Were it not for inaccuracies, some of which have been quoted, and a distressing lack of critique, this book might be recommended, as much of it is fairly well done.

The Medical Annual, 1924. Bristol: Wright & Sons, Ltd.; London: Simpkin, Marshall, Hamilton, Kent & Co., Ltd.

This volume of 822 pages contains over 200 pages of advertising matter, which detracts from its appearance. It contains a review of all the new work done in medicine during the preceding year. These articles are well written and well illustrated. The subjects are arranged alphabetically.

Another section deals with the new books of the year. New drugs, together with their pharmacology and, in some cases, chemical analyses, are reviewed. New apparatus, together with the names of the dealers selling it, is described and illustrated. The remainder of the book is a directory of medical institutions, colleges, hospitals and spas.

The medical portions of the book are written by scientific men of some note. Their purpose has been to include only such matter as has been found of scientific value.

The Practice of Pediatrics. By CHARLES G. KERLEY, M.D., formerly Professor of Diseases of Children, New York Polyclinic Medical School and Hospital, and GAYLORD W. GRAVES, M.D., Associate in Diseases of Children in the College of Physicians and Surgeons, New York City. Third edition, revised and reset. Octavo of 922 pages, 150 illustrations. Philadelphia and London: W. B. Saunders Company. 1924. Cloth, $9 net.

Dr. Kerley writes from the standpoint of a practitioner of long and varied experience. This edition of his textbook, revised and brought up to date, is eminently practical for the general practitioner as well as the pediatrician. From the diagnostic angle all the important subjects of medical pediatrics seem to be excellently handled, and the notes on treatment are ample and essentially practical.

Sterilization of milk for infant feeding does not seem to be entirely accepted by the author, who still believes that raw milk is the food of choice, despite the observations of recent investigators. Vitamin A deficiency is given as the most probable dietary cause of rickets, although it has been amply proved and is now generally accepted that some other factor is the important one. In the treatment of epilepsy the ketogenic diet, which has so far given the best results in controlling the disease, is not mentioned.

Kerley's "Practice of Pediatrics" continues to be, as it has been for ten years, one of the standard textbooks on the subject.

Angina Pectoris. By SIR JAMES MACKENZIE. London: Henry Frowde and Hodder & Stoughton.

In this volume Sir James Mackenzie not only develops his ideas as to the cause and mechanism of angina pectoris but discusses at great length the principles that underlie the production of pain in general. He also expresses his views as to the proper methods of studying disease and prosecuting research. Strong appeal is made for the careful study of symptoms by the physician in all patients, especially during the early stages of diseases. These latter views he has again and again emphasized in many of his writings during recent years.

His general theme as to the mechanism of anginal pain, as expressed in this book, is that the pain indicates and is the result of heart fatigue and exhaustion, and its variability in different patients depends in a measure on the sensitivity of the viscero-sensory and viscero-motor reflexes. There is much that is speculative in this volume, but although without proof a good deal of it is rather convincing. There are 160 case histories of angina, given rather briefly, which illustrate the various points brought out in the earlier chapters of the book, and many of the cases have post-mortem findings added to them. This is an extremely valuable portion of the book, as they represent cases selected from an enormous clinical experience going back many years.

The author is either unfamiliar with the clinical picture of infarction of the heart or has neglected to discuss it at any length. Some of the cases that are described as status anginosus are typical illustrations of coronary thrombosis with cardiac infarction. This condition has been recognized as a clinical entity only in recent years and might well have occupied a more conspicuous place in a treatise on angina pectoris.

The book is an invaluable one as expressing the views of an author who has added tremendously to the modern concepts of heart disease. In a measure it serves as a review of his life's work, for it not only discusses heart problems but also takes up his ideas of the mechanism of symptoms in general and gives a criticism of the trend of medical investigation that has interested the author in the latter years of his life.

ACKNOWLEDGMENT OF BOOKS FOR REVIEW

The Crippled Hand and Arm. By Carl Beck. Philadelphia and London: J. B. Lippincott Company. 243 pages. Price, $7.

Fractures and Dislocations. By Philip D. Wilson and William A. Cochrane. Philadelphia and London: J. B. Lippincott Company. 789 pages. Price, $10.

The Diagnosis of Children's Diseases. By Professor Dr. E. Feer. Philadelphia, London, Montreal: J. B. Lippincott Company. 551 pages. Price, $7.

Infection, Immunity and Inflammation. By Fraser B. Gurd. St. Louis: The C. V. Mosby Company. 329 pages. Price, $5.

An African Holiday. By Richard L. Sutton. St. Louis: The C. V. Mosby Company. 180 pages. Price, $2.25.

Operative Surgery. By J. Shelton Horsley. St. Louis: The C. V. Mosby Company. 784 pages. Price, $12.50.

The Normal Mind. By William H. Burnham. New York, London: D. Appleton & Co. 702 pages. Price, $3.50.

Physiological Principles in Treatment. By W. Langdon Brown. New York: Wm. Wood & Co. 511 pages. Price, $3.75.

Textbook of Physiology. By William H. Howell. Philadelphia, London: W. B. Saunders Compaany. 1069 pages. Price, $6.50.

Serum Diagnosis of Syphilis by Precipitation. By R. L. Kahn. Baltimore: Williams & Wilkins Company. 237 pages. Price, $3.

Elementary Anatomy and Physiology for Nurses. By H. Clifford Barclay. New York: Wm. Wood & Co. 411 pages. Price, $3.50.

The Internal Secretions of the Sex Glands. By Alexander Lipschutz. England: W. Heffer & Sons, Ltd. America: Williams & Wilkins Company. 513 pages. Price, $6.

Les Maladies des Glandes Endocrines. By Knud H. Krabbe. Paris: Librairie le Francois. 92 pages.

International Conference on Health Problems in Tropical America. By the Medical Department, United Fruit Company. Boston: United Fruit Company. 1010 pages.

Medical Education. By Abraham Flexner. New York: The Macmillan Company. 334 pages.

Studies from the Rockefeller Institute for Medical Research Reprints. Volume LII. Baltimore: The Williams & Wilkins Company. 601 pages.

Pediatrics. Volume IV. By Isaac A. Abt. Chicago, The Year Book Publishers. 381 pages. Price, $2.

Practical Therapeutics. By Hobart Amory Hare. Philadelphia and New York: Lea & Febiger. 1061 pages. Price, $7.